SCHOOL AND SOCIETY

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COLLEGIATE EDUCATION AS A NATIONAL PROBLEM

THIS year is already notable in the world of education for the new periodicals and the new societies it has brought forth. I have not heard whether the proposed Association of University Professors was successfully launched or not, but one thing in the constitution prepared for adoption by that society gives me a text for this morning. It was stated that one of the objects of the organization should be "to facilitate a more effective cooperation among teachers in universities and colleges for . . . the methodical examination and discussion of questions relating to education in higher institutions of learning."

It seems to me that the outcome of such a purpose, followed to the bitter end, would be to make of each college faculty a class in pedagogy. The course to be pursued by this class would be one in Hochschulpädagogik. It would be repeated each year, with variations, and never passed by even the brightest member of the class.

The organization which you are forming this week, here in Chicago, might well enough adopt the same purpose as part of its program. Then the difference between the two societies in this one particular would probably be merely a difference as to who should conduct the faculty class in pedagogy. The society of college professors might say that such a class should have no head, but should conduct itself. The society of college presidents might propose that it be led by a dean or even by the president himself. The college professors ought to know whether a class needs a leader or not. On the other hand, our college presidents have most of them been college professors at one time or another; and the fact that they have enjoyed, or at least have undergone, this double experience, may have rendered them rather "set" in their own opinions. If the college president's original professorship should happen to have been in the field of educational theory and practise, the idea of a college faculty that should meet from time to time as a class in pedagogy must appear to him as altogether charming. I know of one such college president at least who is strongly tempted to propose a program of this sort as soon as he goes back to his work, and then to look on cheerfully and see what will happen.

Really, though, there may be something in the idea. Why not? It is different, is it not, from the old familiar course of faculty meetings, and yet not so different as to be revolutionary. I can imagine that there may be college presidents so abounding in tact, and so richly endowed with the confidence of their faculties, that they could carry such a project as this into full effect.

It would involve some real addition to professorial burdens, and perchance some real addition to presidential burdens. It would mean a new and more concentrated effort to view faculty problems as a whole, and not merely as a haphazard summation of departmental and individualistic preferences.

Just to see how it might work out, I will venture to suggest certain topics that might enter into the first year of the course:

What bearing has the more recent literature of educational theory upon the problems of college education?

What rights and responsibilities have the secondary schools that college entrance requirements are bound to respect? How shall we distinguish in this matter between the secondary schools that want the colleges to tell them what to do and the secondary schools that want to tell the colleges what to do?

What are the essential relations of general education to professional education, under actual modern conditions? How can we inject the seriousness of the professional school into the student life of the college? And do we want to do it if we can? And how long will the public take the college seriously if we don't?

How can we shorten the apprenticeship of young college instructors, for their own good and the good of their classes? What ought they to be taught about teaching, beyond what we knew when we began to teach?

What principles underlie the formulation of requirements for college admission and graduation? Or should these requirements represent merely a working compromise between rival interests in college faculties?

Why do the graduates of good colleges generally turn out reasonably well in life? Can we find out how the college has contributed to their success and to their moral character, and then work it a little harder in these directions?

And then, what is a college degree, really?

We should all of us be the more hopeful of the success of such excursions into the higher pedagogy, because of the work that we have already seen done by faculty committees. Have we not known such committees now and again to spend days and nights and many weeks on the revision of the curriculum or the formulation of some new policy. And the discussion of their reports by the college or university bodies to which they have been made—faculties, councils, senates or by whatever name they may have been called—has not that discussion often risen to heights of real educational vision? After we have cast our gibes at the routine sessions of these academic bodies, the fact remains and must be recognized that some of the finest and most illuminating debates of genuine educational questions are those which not infrequently go forward, without publicity and without excessive pedagogical consciousness, in these legislative bodies of our higher institutions of learning.

Let me go a step further, and make a remark that is so reactionary as to be almost radical: I believe that to-day our best knowledge and wisdom regarding the prevention and cure of disease is generally to be found in the medical profession; our best knowledge and wisdom regarding religion is generally to be found among priests and ministers of religion; our best knowledge and wisdom even regarding legal procedure is still to be found among lawyers; and our best knowledge and wisdom regarding education is almost as generally to be found among educators. Our main reliance for a comprehensive national program for our higher education must be the faculties of our colleges and universities.

We certainly need such a national program, less fragmentary, more organic, more free from internal competition and contradiction, than that which we now have. It seems fair that we should look to the teaching bodies of our higher institutions of learning for the gradual working out of the main lines of such a program. This is a subject for serious consideration by our faculties everywhere. Our faculty-pedagogy is to rise to its greatest height in

the study and investigation of a real and influential Nationalpädagogik, not to say a Völkerpädagogik.

It is not to be denied that recent events in Europe have intensified this conviction. It seems clear that the education of a people in the wisdom and ideals that make them strong and great is as important for national self-preservation as is direct provision for the national defense. Even if it should appear as our national creed that no two citizens should think alike, we have still to achieve a national unity through the insistence that every one should know why he thinks as he does, and should learn to work with those whose thoughts are different. It may be that the first tenet of our ultimate American pedagogy will be that every man's education must be different from every other man's; but if so, this tenet will need to be balanced by two others, namely, that every man's education must be honest and thoroughgoing as far as it goes, and that every man must learn, as far as in him lies, to understand his neighbor's point of view.

The making of a really national provision for our higher education involves a good deal more than the defining of national ideals of instruction.

It involves such a determination of our standards as will assure confidence in our academic and professional degrees, both at home and abroad. This is a most difficult and necessary undertaking, on which a score of educational agencies, governmental, academic and private, are now engaged. The constructive leadership of the Federal Bureau of Education in this matter is most timely and promising.

It involves a close consideration of the desirable distribution of colleges and universities. The information collected over a term of years by the General Education Board has an important bearing on this question.

It involves important questions of educational administration and control: The relation of state and municipal colleges and universities to those conducted under private auspices; the need and appropriate functions of a national university; the unlimited possibilities of interchange and cooperation between existing institutions including institutions of special research and governmental bureaus as well as ordinary colleges and universities.

What a vista opens up on even a first consideration of this subject! The college faculty that should seriously debate such general questions as these would gain an educational perspective which is rarely attained save by a few individual members of these bodies.

The vista indeed leads out much further than I have indicated. Every day it becomes more apparent that every large undertaking upon which our people may enter is conditioned upon improvements in our system of education. The advance of agriculture, the building up of foreign commerce, the extension of the suffrage and of various forms of direct legislation, the promotion of comprehensive justice and good-will in our industrial society—these are only a few examples. Every effort to realize more completely an American democracy depends upon education and more education. The larger democracy of humanity that we dimly foresee, the democracy of nations, to which America might contribute so much, makes an educational demand that is even more exacting.

We do not have to discuss any of these problems at this time. The simple tale which I have had to tell leads up to these things and finds its moral where such discussion begins. And that moral may be

stated in the briefest terms, somewhat as follows:

First, the life and work to which this nation is called will surely demand an educational consciousness and an educational program that shall be truly national;

Secondly, the fostering of that national consciousness and the making of that national program, must be primarily the work of our professional educators; and

Thirdly, it is to be desired that the faculties of our colleges and universities should consider not only the problems of their separate institutions, but should also contribute of their best wisdom toward the solution of these larger problems.

ELMER ELLSWORTH BROWN

SHALL MASSACHUSETTS EQUALIZE EDUCATIONAL OPPORTUNITY?[1]

I AM impressed by the fact that more lies are being told this year than ever before in the history of men. Some of them are known to be lies by those who tell them with the object of deceiving those who hear them. But most of them are that more virulent kind of lie which deceives the teller as well as the person to whom it is told. Our generation is at this moment experiencing the largest sized psychological demonstration which the world has ever had of the overwhelming importance of the truth and the nearly insuperable difficulty of getting it. The positions which men take, the side which they choose, and the acts which they perform, are determined not by the facts, but by their views of the facts. When they attempt to justify themselves to other men, they rely not upon facts, but upon general principles, such as "Treaties are not scraps of paper," "We are fighting in self-defense and to fight in self-defense is holy," "Necessity knows no law," etc. I talked with a very likable young German the other day about the war. "Yes," he said, "it is awful; but the awfulness of it is that the English and the Germans are brothers, and brother is fighting against brother. But the Slav and the Japanese is not a brother." This immense psychological demonstration is teaching us once again that ideals and general notions are the real determiners of conduct, that after all it is a man's or a nation's philosophy, the point of view from which it looks at facts and interprets facts, which counts. It is not what goes on outside of us, but our interpretation of what goes on, that we are concerned with. That interpretation is determined by our points of view, our expectations, our problems, in short, by the kind of general notions we keep.

It is the same with this matter of state taxes for the support of public education. We take the position which we take, not because the facts drive us to that position, but because of our notion of what the state should do, or our notion of what the local community should do. Indeed, it is not surprising that facts do not coerce us, but that general notions do; for facts have no motion in them, they just are. All the motion that is developed in connection with them comes from us. We do something about them, and what we do about them, is our body of general ideas.

I take the position which I take in regard to school funds because of the position which I take with regard to the state. I believe that education is a state affair, and must be defended and upheld by the entire energy and all the resources of the state. If we want to know whether the wealth of the state should be taxed to support the schools of the state, we must first know what the state is. One of the questions which this frightful war is forcing each one of us to answer is just this, "What

[1] An address before the Massachusetts Association of Superintendents of Schools, February 19, 1915.

is the state? Is it a something which exists apart from the folks in it, a metaphysical entity above the totality of its inhabitants? Is its essence power, so that its one relation to its people is to order them to obey, or does it exist by the consent of the governed?'' We have of late been hearing strange and confusing doctrines which seem to have entailed a horrible sacrifice on the part of the people who believed them.

But if the state is not power, is it history? Are its nature and its functions prescribed in its title deeds? Does it exist only to do over again what it has done to date—to repeat to-day its good deeds of yesterday and its bad deeds too? If we say that the state is history, that it exists to-day to be the historic thing that it was yesterday, we make a fetich of it, and that philosophy entails wrongs and woes almost as oppressing as the philosophy that the state is power. The only Massachusetts that exists is the one of which you and I and the other folks who are alive at this moment are inhabitants. That state we make by our will and we give it being that it may do for us all certain things that we can not each of us do for ourselves. The state, then, is an organization of all of us to do certain things for each of us that we can not do for ourselves. One philosophy says that it grew out of a contract to protect life and property—that its powers are police powers, that it must protect lives and property by maintaining a thorough police and by keeping down the taxes. But what are the duties of a state in regard to keeping down the taxes? How much are France or England at the present moment warranted in taxing their people? All that the stockholders in the corporation, which is called France, or the members of the common undertaking, which is called England, are willing to devote to maintaining the business of being a nation. The state is not an organization to keep down taxes, but to keep up the public work. Its primary purpose is not to protect property, but to further the common business of living together.

A part of that common business is not going as well as it should. Public schools are maintained in every community in Massachusetts in accordance with state regulations, which fix the minimum length of the school year, and compel the towns to furnish text-books and other supplies. Towns of more than 500 families must maintain high schools for 10 months each year. The state prescribes the subjects to be taught. In short, the state fixes the educational liability but does not provide the means to discharge it. The report of the Commissioner of Education for the year 1912 declares that

> in every state in the union other sources of school revenue besides local taxation are drawn upon to meet the cost of public education; but it also appears that in Massachusetts local taxation is the source of school support to an extent greater than is the case in any other state.

When the school system of Massachusetts was taking form, the chief industry of the state was agriculture, and the wealth of the state was in the country. Cities have arisen since that time, land values have decreased, and the wealth of the state is now centered in great commercial and industrial communities. The method of supporting the schools has not been changed to keep pace with the redistribution of the wealth of the state.

Figures which the Commissioner presents show that there is $14,212.38 of taxable property behind every child in school in Boston to guarantee his right to an education, $7,075.84 in Worcester, $9,297.45 in Springfield, $11,453.31 in Newton, $28,815 in Brookline, and but $654.47 in Gosnold,

$855.56 in New Ashford, while between these extremes the valuation varies greatly. As a result, the burden of supporting public education is most unequally distributed. If one owns $10,000 worth of taxable property in Boston, he pays $28.80 for schools; in Brookline, $20; in Williamstown, $56; in Saugus, $72; in Abington, $90, and in Springfield, $44.

But the $20 which he pays in Brookline provides $59 per pupil, and enables that town to pay a median salary to teachers of $850 per year. The $44 which he pays in Springfield provides $40 per pupil and a median teacher's wage of $750. The $56 which he pays in Williamstown provides $26 per pupil, and a median teacher's wage of $418, while the $90 which he pays in Abington provides $30 per pupil and a median teacher's wage of $600.

Not only are the burdens unequal, but the quality of the education which the more highly taxed towns are able to provide even when they tax themselves vigorously falls much below that which more wealthy towns with lower taxes are able to provide. Public education, which is perhaps the chief constructive business which the organization which we call the state has to maintain, can not be properly carried on under these conditions. It calls for more adequate support. The state, as a whole, must become responsible for it. It does not give to each separate community the responsibility of checking the ravages of the foot-and-mouth disease, or of the gypsy moth. It itself is quick to prevent the destruction which menacing local conditions, if left to their own limited resources, threaten. It must be no less vigilant in safeguarding the education of the young. It is said that a king of former days who agreed with his people that his rule had wrought much harm to them, and was human enough to regret it, repented of the evil which he had done by saying, "I could have been a good man, but for this infernal science of geography." The science of geography may have too great a place in the thoughts of kings, but it is clear that it must have a larger place than it has yet had in the attention of the folks who make the laws which control our public education.

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INDUSTRIAL SOCIETY AND INDUSTRIAL EDUCATION[1]

The function of education in our day seems to have expanded to such a degree that many school-men of conservative temperament are asking, "where is it going to end?" I should personally dislike to be burdened with the responsibility of attempting to answer such a query, for it is far easier to point out the possibilities of the further extension of the functions of education than to define the limits. We school-men are apt to think that education is more radical in its present program than are the other social agencies. This, we recognize upon reflection, is hardly the case. The functions of government in particular have been greatly expanded beyond that deemed probable a generation ago. We contemplate without a shudder such principles as the minimum wage, child-labor acts, workmen's-compensation act, widow's pensions and the like. Even a generation ago the functions of government were chiefly limited to the protection of life and property—functions rather negative than positive. To-day government is imbued with more active policies and is taking offensive action against social ills by aiding the weaker members of society who suffer from the miseries of ignorance, disease and

[1] Read at the Boston Principals' meeting, January 12, 1915.

less favored environment. Government to-day is putting its energy into preventive measures rather than in the former curative laws.

Education to-day is but feeling the common, social impulse in its policy of expansion and would fail to interpret the aspirations of the race could it in the midst of flux and expanding life remain passive and indifferent. Much of the present ferment in government, industry and education may be improperly treated by the various agencies which each social instrument is setting up, but the effort to interpret new needs and the attempt to meet expanding demands are praiseworthy. Each social force must make the effort for successful adjustment and we may hope that the mistakes made may not be too costly. Few will question the intentions of those who seek a better way, but this is not overcomforting with the warnings of history before us; for with the best of intentions governments, corporations and educational enterprises have failed in many of their undertakings.

Along with our attempts at better efficiency in the traditional work of the schools we are attempting to extend the influence of education to reach those children who have been but slightly affected by formal school influences. Not the gospel example of the one sheep who has strayed away from the fold of one hundred, but the fifty or more who have wandered away from our pastoral care give us concern in our schools. The gospel standard of efficieney was not content with the relative high figure of ninety-nine per cent., while we have rested comparatively undisturbed until recently with a much poorer average.

The subject under discussion to-day brings us concretely to the consideration of what our Boston school system is attempting in what might be broadly termed extension education for those who need educational opportunities differing from what used to be called the conventional type; in such schools as the Trade School for Girls, the Industrial School for Boys, compulsory and voluntary continuation schools, prevocational schools and part-time schools of many kinds. It is a commonly mistaken notion that this new array of school opportunities is designed to supplant existing schools. The function of our newer schools, however, is in reality very different. These newer schools are supplements rather than competitors to the longer existing institutions. In the field of secondary education where educational extensions have been more largely developed, we have seen a growth in attendance of about 130 per cent. during the past six years—the period of active development. Even our Public Latin School has grown in this period at a rate as fast or faster than has the increase of population of our city.

It is true, perhaps, that a somewhat larger proportion of pupils in general high schools are pursuing studies more applied in character than academic; but the general result has been that more boys and girls are under educational influence of some kind than formerly. If the educational influence is beneficent, then we have gained in the main. A rather careful accounting of school children made within the past year shows that there are approximately 24,000 children in Boston between the ages of 14 and 16. About 4,000 working certificates are issued to this group and the remainder are accounted for largely in our schools, either in high, elementary or in special schools—a situation somewhat better than is usual throughout our country.

We are as a nation about to recast our idea of what should be the minimum educational equipment for the individual. Up to the present our ideal has been that of

literacy, that each citizen should be able to read and write, under the supposition that with this bare essential the individual may work out a satisfactory destiny. The coming ideal promises to be that each individual must through some appropriate educational process be rendered a social and industrial unit with a certain degree of efficiency. The immediate future will see the development of the human asset, as the immediate past has seen the development of the machine and of the material asset. Thus it is that we have outgrown one type of school or a few types of schools and have developed many types of schools, and shall need many more yet, for there are many kinds of individuals and many kinds of jobs.

A policy of vocational education ought to be founded upon a rather careful analysis of the vocational demands and opportunities found in a given community. Vocational guidance affecting the individual, the law of supply and demand affecting the labor market, possibilities of cooperation between employer and the school, are subjects of large importance in formulating plans for appropriate applied education. Few American communities have developed educational extensions of any sort in a systematic or fundamental manner. Usually, the procedure is undertaken in a piecemeal, empirical fashion. A community may appease its conscience towards industrial education by establishing a trade school and rest content with a conviction of having performed its full duty. Trade schools are valuable institutions for most communities; we have two in Boston, each performing an important service; but the greatest range of usefulness of any trade school falls far short of the needs and possibilities of a large majority of our boys and girls who go into industry.

An examination of the organization of industry reveals the situation that only a small proportion of workers will find employment in anything that may be called a skilled trade. Roughly speaking, industrial production to-day proceeds upon a method where about ten per cent. of the force perform skilled trade manipulations and the remaining large mass perform automatic operations. Modern factory specialization has broken up the old complete trade of making shoes into 180 or 200 operations, so that a shoemaker to-day is 1/180 or 1/200 part of a shoemaker; and so it is with candy-making, power-machine operating and a host of other industrial processes. However, the skill and speed demanded in many industrial operating processes is of a high order and the resulting earning power often surpasses the wages of the older skilled trades. But the fact still remains that operating is different from trade procedure, and that a trade school is not organized at present for the training of operators.

The scarcity of trade skill in this country has been the most potent cause for the development of the automatic machine. The ability of the mechanical inventor has duplicated a thousand-fold, in some cases a million-fold, the skill of the former craftsman; but the creative genius is in the machine, and for the operator remain only speed and endurance. There may arise doubt in the minds of many whether or not our wonderful inventions in the way of operating machinery do not constitute a new industrial Frankenstein which may become a menace instead of a benefit to society. The whole situation has something of the appearance of the vicious circle, which might be described as follows: Lacking skill, we have created machinery and, having created machinery, we have abolished the need of skill. The need of skill having passed, can we contemplate

with no perturbation an industrial situation where the great mass of workers are destined to remain unskilled?

One thing is quite certain, that whereas the operations of our wonderful machinery are largely automatic, the adjustments which society must make to operating machinery can in no way be automatic. We have abandoned the laissez-faire method of dealing with industrial ills—the price is too great. The process of scrap-heaping machinery in our factories goes steadily on. We have by no means reached the type of most efficient machine, and consequently the continual adjustment of the worker must constantly take place. We have the reassurances of history that the effects of labor-saving machinery have always been beneficial to the mass in the end; it is by no means certain, however, that the most sinister effects of extreme subdivision of work and specialization of process have yet been experienced. We read of past industrial periods, of the trials and miseries of the workers during the process of readjustment, and we know that similar stress, though less acute, is a current phenomenon. The machine which upset the industrial equilibrium was created in a day, but it took a generation or two to bring the worker into successful readjustment. A somewhat similar condition may threaten us to-day unless our governmental and educational forces are wisely, generously and quickly brought into action to make the readjustment easier and less fraught with the miseries which have attended previous similar industrial epochs.

Let us consider briefly some of the operating (so-called) trades and see what relation educational processes may have to the improvement of the lot of the worker. Operating processes are learned in intervals of time varying from 15 minutes to about a year. The simpler operations of the candy trade come near to the lower limit, the more complex operations of the needle trades come closer to the upper limit. The other day when going through an industrial plant in Hyde Park, I noticed a room filled with young women winding tape on copper wire for armature construction. The foreman of the room stated that it took the workers less than a week to reach a standard of satisfactory production. In the cigar factories of Richmond last month I saw thousands of women at work on the various automatic machines, each machine performing some essential function, and was told that the amount of instruction required for each process was comparatively slight. When I was a boy I remember the elaborate movements the street-car conductors made in collecting fares—punching a strip and ringing a bell. To-day the conductor surveys proceedings with a calm air of supervisorship and handles a much greater number of passengers. In the surface cars he still has to turn a hand crank to get the money out of the box; but at the main subway entrance, the choppers even are operated by electric motors, and the gate men watch the passengers, not the machines, for the passenger may not be automatic in uniformly depositing a nickel. Simple operations such as the above, and they involve the duties of thousands of workers, probably a majority at least, have no educational content. No courses to be conducted in our schools could give much in the way of skill or related technical knowledge. The Richmond Survey states frankly that the problem of training the tobacco workers, which employs thousands of persons, is not a school problem; it is, however, a social and related educational problem, as we shall subsequently indicate.

Our Trade School for Girls is one of the notable instances of a foundation attempt-

ing to meet the needs of girls going into industry. It can not, from the nature of conditions described above, meet the needs of more than a small minority of working girls. It serves, as do our other secondary institutions, the needs of the fortunate members of its class. Think of the disparity between the thousands of girls who go into industrial occupations and the few which our limited accommodations permit us to deal with (about 500 pupils). Think of the disparity between opportunities for skilled processes, and the larger mass of simpler operating manipulations. A considerable number of girls in our Trade School are preparing for millinery occupations—occupations which remain in part in the older handicraft stage. Here, skill, dexterity and *quality* of product still remain as the result of the limited demand for hand work on the part of the community which can afford to pay the higher price. The demand for these hand workers is limited, but owing to the small capacity of the school we probably prepare no over supply of skilled workers. But a small proportion of women's hats are produced by the handicraft method, and consequently our school is not touching deeply the trade methods of millinery.

Our largest group is preparing for hard work in dressmaking shops. Again the condition is similar to that of millinery. We live in a time of manufactured clothing for women as well as men. The great proportion of clothing is produced in factories, by specialized processes by means of automatic machinery. Up to the present time we have been preparing our girls for the limited number of superior shops which meet the smaller demand for high-grade, hand-made clothing. In our straw-machine department we are training girls for factory conditions where automatic machinery, standard production and large-scale methods are met. This department represents one of the ways in which our school may train some of the girls for modern high-grade operating processes. Were it not for the fact that straw-machine operating is not a large industry in comparison with other industries, this type of endeavor of the school would represent a practical means of fitting workers for actual conditions of industry. The methods, conditions and procedure of straw-machine operating are typical of a large proportion of automatic production, requiring specialized skill, training and some technical knowledge, and here the wages are an incentive to workers.

Power-machine operating connected with the so-called needle trades represents the largest demand for girls in the garment industries. We have attempted with no great success to persuade girls to prepare for these trades. But both the girl and her parents have a disinclination for factory work. There is evidently here a tremendous difference between the inclination of the worker and the conditions of the work. Wages are not the chief consideration of the woman worker. The machine operator can command a substantially higher wage than the hand worker, and the chances of employment are much better, but the girl chooses a lower paid but more agreeable job. Apparently the girls who do go into the clothing shops do not present themselves at our trade school. Consequently, they do not go in with any preliminary training, but must pick up their skill in the hit-or-miss fashion that is so detrimental to the worker and so burdensome to the industry.

We have just presented to the School Committee a plan of extension part-time work, whereby our Girls' Trade School would be able to make a valuable connection with the sewing trades in a way that

has not been found possible elsewhere in our state. We propose to take young women (to some extent young men) who have already established a foothold in the needle industry and, either by a half-time plan or by a concentrated period of six weeks (all day, eight hours a day and six days a week), to enable the young worker to perfect herself in the operation already pursued in the factory and to acquire the next process in the way of skill which will enable the worker to increase her earnings and enlarge her usefulness. This step is significant because it represents a concrete illustration of what industrial education must do to make practical contacts with the great mass of industrial production as it is actually carried on. By such a plan we can show how the major needs of the workers, in a typical industry, may be practically met.

Our Industrial School for Boys offers practical training for boys hoping to enter with some acquired skill the trades of machinery, cabinet-making and carpentry, electricity, sheet-metal work and printing. What is true of women's industrial occupations, regarding general trade skill and specialized processes is largely true respecting the industrial occupations of men. Trade skill may not be reduced to the small proportion characterizing the woman's job, but the condition is quite similar. I have been told that tool-making is about the only branch of the machine trade where general knowledge and skill are still required. We are accustomed to think of automobile construction as an instance of highly developed skill and craftsmanship. Such, however, is not the case. The tools, the dies, the patterns and automatic machinery may be made in the machine shops of Worcester, Fitchburg and Springfield; but the operators use these productive instruments in Michigan. An automobile is made up of something like 19,000 parts, most of which are produced by automatic machinery. In Michigan the manifold parts are assembled by either partly skilled or highly specialized workers. It is by this developed process that our enormous automobile product is possible. We read of one company, as an instance, which is able to turn out one completed machine a minute.

It is evident that most of the boys who go into industry can not find employment in skilled trades. Our Industrial School for Boys with its present limited facilities, or with its utmost possible expansion, can not meet the needs of any considerable fraction of the boys who will eventually find themselves in industry. This school, however, does give the ambitious boy the chance to enter industry on the most advantageous side. In spite of the increase of operating processes in men's industrial occupations there is still a considerable demand for skilled trade workers. The factory is not equipped to train workers, for the function of the factory is production, not education. A trade school is a useful institution for any large city to maintain. Nevertheless, I repeat that a trade school in itself is not the only means, nor indeed the chief means, of meeting the problem which is so pressing at present in adjusting the worker to the work.

Many believe, from a study of tendencies and conditions in industry, that the needs of the majority of our industrial workers will be met by the establishment of continuation, part-time, cooperative and prevocational schools. It is apparent to all that the needs of the great majority of our workers are not at present met by any educational provisions. We have a permissive law in Massachusetts which allows communities to establish continuation schools. Thus far Boston only has taken advantage of this opportunity. Wisconsin has estab-

lished a state-wide system of compulsory continuation schools, and in addition a compulsory system of apprenticeship training for the skilled trades. This legislation is comprehensive in character and shows an appreciation of the problems of an industrial state.

We need in Massachusetts a new continuation school law for working boys and girls between the ages of 16 and 18. Our present law (14 to 16), even if it were taken advantage of, which it is not, is largely inadequate. It is only at the age of 16 that the boy or girl makes an advantageous connection with industry so that he has a job which has much possibility of training. Our present continuation schools in Boston are largely prevocational in character. Such schools are very valuable to many boys and girls who are enabled thereby to realize the importance of seeking the better opportunities in business and industry and of acquiring a minimum amount of skill so that they shall be able to occupy more advantageous positions. The continuation school can not be for a considerable class of industrial workers a trade improvement instrument; but the continuation school can be for these an opportunity for general improvement, for healthful recreation, for counteractive influences to the automatic processes whereby the majority of workers earn their livelihood; in a word, for the educational and social influences which make for larger life and better citizenship. Our school centers might easily assume more of these functions, which service, indeed, they are already performing in part. Many workers on automatic machines need not industrial improvement, but recreational, social and civic influences, which opportunities the school centers may most appropriately furnish.

I am aware that in presenting this exposition of industrial conditions together with some suggestive appropriate educational provisions I have not outlined too cheerful a picture, and I do not seek to correct that impression. I am, however, by no means hopeless. I believe that either serious stress or successful adjustment may easily be the result of present conditions, and the one or the other will result largely from the way that we of this generation meet the manifest problems before us. President Wilson in his address at Indianapolis last week stated that we live in a critical age, fraught with political, economic and civic problems. The challenge to our national powers may not be that of warlike might, but a compelling challenge none the less. We must face the fact that our modern conditions of life are complex and perplexing. It is quite certain that these conditions will not settle themselves; and that we must devote our thought and our efforts to their solution.

The great mass of workers who need our ministrations do not often appreciate or sense their own needs. Theirs is the vast silent voice which pleads the more eloquently in its dumbness. Individually and unorganized they are the weaker wards of the more favored and intelligent guardians of society; among these guardians are our legislators and educators, and if these chosen servants of the people neglect a manifest duty and a social opportunity, a wiser posterity will blame their ignorance and folly.

Frank V. Thompson,
City of Boston Schools

IN MEMORIAM—SUPERINTENDENT JAMES M. GREENWOOD[1]

On November 15, 1837, on a farm in Sangamon County, Ill., a boy was born. On August 1, 1914, a great man died at his office

[1] Address before the National Council of Education, February 22, 1915.

desk in Kansas City, Mo. Thus was the earthly beginning and end of James M. Greenwood, whose life for forty years was one of the strongest influences in the development of public education in America.

The chronology of his most significant activities in the National Education Association reads as follows:

In the Association—
- Life member since 1884.
- Life director since 1886.
- Treasurer from 1891 through 1895.
- Member of executive committee 1891 through 1895, 1898, 1899, 1911–13.
- President, 1898.
- Member of board of trustees, 1896, 1905–14, secretary, 1908–11, chairman, 1911–13.
- Vice-president, 1898.

In the National Council—
- Member since 1885.
- Member executive committee, 1889, 1897, 1905–14.
- Member of committee on membership, 1900–14, chairman, 1905–14.
- Member committee on investigations and appropriations, 1901–14, chairman, 1909–14.

On Committees—
- 1895—Committee on revision of constitution—general association.
- 1885—Committee on technical education—council.
- 1888—Committee on educational statistics—chairman—council.
- 1894–6–7—Committee on educational statistics and reports—council. (Same committee—name changed 1891.)
- 1889—Committee on hygiene in education—council.
- 1893—Committee on reorganization of national council of education.
- 1901—Advisory board of Louisiana purchase exposition.
- 1907—Committee on taxation for school supplies—council.
- 1901—Committee on selection and publication of material relating to city school supervision—superintendence.
- 1907—Committee on teaching morals in public schools—chairman—general association.
- 1907—Committee on cooperation with educational organization in other countries.

Such statement might serve as the cold inscriptions on his tomb. His epitaph speaks in the quickened pulses of lives stimulated by the vigorous intellectual and moral forces that had their source in him.

It is no great stretch of the imagination to trace his strength to those same influences that shaped the course of that great leader of the people whose young manhood developed in Sangamon County. A happier fate shielded the childhood of young Greenwood and kept from his placid brow those furrows of foreboding which sculptured that of Lincoln. But the touch with homely nature and the everyday affairs of a simple rural life where the boy participated in the cares, labors and conversation of men educated him into a human sympathy which the artificial barriers of a more complex social condition is apt to narrow or shut out. Such social environment may give to the child quicker insight into the motives which move men, and an earlier understanding of their wants and of the means of approach to their heads and hearts. The boy of capacity under these conditions of real participation in the life of his elders soon gets some measure of his power, some comprehension of his needs, some strength of will to cope with the problems that are put upon him. He is under the necessity of being resourceful. If the needed harness or tool is not at hand, his ingenuity is aroused to create or shape it. Skill comes, too, in the adaptation of crude implements to the work to be done. To such a boy a jackknife is a box of tools, a half dozen books are a library. Deprived of many books, Lincoln focused upon the Bible the fervent heat of his intense mind and its pure gold was fused into the fiber of his intellect and emotions. Chance, or we would rather believe Providence, brought to young Greenwood the treasure of a small number of choice books from the library of a neighbor who had died. His training in self help served him well in mastering their contents. He drank of their knowledge and was stimulated by it.

When the boy was fifteen years old the family moved to Missouri. During the next two years from his occupation on the farm he could snatch but scanty instruction in the opportunities of a frontier district school. For the next ten years he took an extended course in the university of life. His majors were the curriculum of a western seminary in which he broke his health in attempting to do four years' work in nine months, four years in reading law, and three years of service as a soldier in the civil strife that set brother against

brother and in men of character purged away the dross.

Out of this training he came a matured and richly experienced man, twenty-eight years old. Life was a very real existence to him, and pretense and tinsel were abominations, while genuine manhood could not be concealed by homespun garments. The town school, the private normal school, the small college, and the state normal school were the fields of his labors for the following nine years. Mathematics, logic and philosophy sharpened an analytical mind which had singled them out as subjects of the greatest interest. Their influence upon him was manifest in the comprehensive grasp and ordered marshalling of his thoughts, and the clear and vigorous English in which he expressed them.

When at the age of thirty-seven he was called to the superintendency of the Kansas City, Mo., schools, his new position found him peculiarly well fitted for the constructive ability which it required.

In his annual report for the year 1913 he gives a sketch of the conditions he found in 1874 and of the processes of evolution out of them. No skilful painter could draw as faithful a portrait of this man as he himself has sketched in this record of his understanding, his vision, his will, his sense of humor, and his incisive criticism. Commenting on his beginning year he says:

> At the time I assumed charge of the schools twenty per cent. of the entire time in the elementary schools was devoted to formal written examinations from the third grade upward. These were reduced to four, and the pupil's deportment was included as a factor in determining his class standing. . . . The essential qualifications for successful teaching were enumerated as follows: (1) Common sense; (2) ability to manage and harmonize conflicting interests; (3) adaptability to school-room work; (4) a good knowledge of what education means and what it is; (5) knowledge of the branches to be taught; (6) skill and ingenuity in imparting instruction; (7) a deep and abiding interest in the welfare of children; (8) a cultivated voice and manner; (9) a love of the work. The keynote chiefly emphasized was the cooperation of parents and teachers for school-room maladies.

Of the year 1875 he writes:

> The board, superintendent and teachers succeeded in raising from various sources $995.50 with which to purchase books for the beginning of the public library. The following things were done: Relieving the stress in keeping pupils back in their studies; eliminating more than ninety per cent. of the cases of corporal punishment; emphasis placed on the science of education and methods of teaching; a cutting loose from some old ideas and cautiously and noiselessly experimenting with the new, marked some lines of progress. The greatest forward step was elasticity in grading and promoting pupils and avoiding waste in school work.

This "cutting loose from the old and noiselessly experimenting with the new" was the mental habit which made him the stimulating leader and the reliable counsellor. His contempt for methods claiming to be panaceas is expressed in the homely strength of his comment on one of them. He writes:

> This system spread like wild fire in several of the western states, but burnt out in two or three years, and is now found in the educational cemetery.

His wholesome conservatism is further shown in his comments made years ago on topics that are in the focus of attention to-day.

> "*School Myths,*" or erroneous ideas that many persons entertain in regard to what the schools ought to take over outside their legitimate work, was first presented and commented upon *extensively twenty-eight years ago.* . . . The dangers of specialization in school studies prematurely made was commented upon. The contention was that the child before specialization begins should have a broad and solid foundation in scholarship. This is the only sound educational thought at present.

His philosophic comprehension of the exalted aim of public education subordinated to their right relations the means to the accomplishment of this aim, and at the same time frequently carried him ahead of his generation in the recognition of the practical significance of these means. His report tells the story in illuminated words. Of part time work and play he says:

> Owing to the crowded condition of the schools, half-day sessions were resorted to in some of the schools. To furnish room was the constant prob-

lem then as now. This recommendation was then made: "As a matter of justice to small children imprisoned in school for six hours, it would be far more rational that the teacher should instruct them for three or three and a half hours in regular school work, and then devote the remainder of the school day to superintending their play in the open air—in short, to act as 'dry nurses' for the families of the district. By adopting half-day sessions, no time is lost in graded work. The children are healthier. It is in accordance with mental and physical growth; accords with common sense and experience, and is an act of justice and mercy to the children." It took thirty-six years for Kansas City to get partly around to this topic.

Of a school for incorrigibles, he writes:

The establishment of a separate school for incorrigible pupils was advocated. This was urged very earnestly as a means of preventing crime or the tendency to crime in its incipiency. In this advocacy the writer was nearly *thirty years in advance* of public sentiment, which eventually culminated in the enactment of truancy laws and the opening of the McCune Farm and Home.

Commenting on the year 1891–92, he says:

The most important recommendation made by the superintendent in the annual report was the opening of the schoolhouses of evening, for giving public lectures to both sexes of citizens, the lecturers to be questioned by the citizens who felt so disposed. This was to be an independent means of educating the people. The subjects recommended for discussion were education, hygiene and sanitation, economic and social problems. The board was urged to initiate such a movement here. The matter was commented upon and urged at considerable length. Twenty years later the idea was put into operation under the amusement form, the instructional idea being only incidental.

Making what he calls a "fitting close to this chapter of the report for the year 1912–13," he thus addressed the board:

As superintendent I have endeavored to secure unity and effectiveness in management, direction and supervision. Thirty-nine years ago I began my duties in this field with the highest educational ideals, and have consistently endeavored to attain these ideals in the administration of the schools, never sparing expense or personal comfort in keeping abreast of the educational thought in this country and in Europe, and utilizing every safe, progressive measure as the conditions in our community permitted. It has been my aim in shaping the public schools of this city to spare the members of the board of education as much of the specific details of school management as possible, while carrying out conscientiously their fundamental policies. I have coordinated the administrative, directive and supervisory labors in the school organization by never lowering an educational standard, ever stimulating with proper incentives, and being always ambitious for the organization's more scientific development and always measuring the product by the standard. I have sought to keep the principals and teachers rich and fresh in efficient methods and expert educational knowledge drawn from all available sources. Conclusions have always been reached through seasoned convictions on the substantial merits of questions at issue. Sudden bursts of sentiment may sweep over a community, destroying all that is most valuable and leaving nothing in the place of what has been displaced. If a school system is to be well administered, there must be a large amount of continuity in its policies, and definite, fixed principles must be maintained. One of my chief concerns has been to discriminate between what is real, permanent and growing and what is transient, artificial and declining. In every matter connected with the public-school situation I have sought a constructive control, never a destructive empiricism, believing that those in authority should take judicial and comprehensive views on all issues. Short views in educational affairs are most dangerous.

The same qualities which made him a great superintendent made him the invaluable member of the council. His earnest desire to see and know the strong men and women in the association drew him as an onlooker in 1871. His zeal in the cause of education gave character to all of his participation in the work of the association from his admission to it in 1884 to the time of his death. As an officer of the association and of the council his well-seasoned judgment was used without fear in their protection. In reports to the association his solicitude for its welfare gives to his words some tinge of suspicion and anger when he feels that selfishness is attacking a common good. Under the caption of "The Permanent Fund and The Raiders," he says:

As soon as this fund was of sufficient size to attract the eyes of the covetous, all kinds of schemes

were devised to get hold of it and dissipate it. . . . As chairman of the committee on investigations and appropriations, I have had exceptional opportunities of receiving communications and listening to those who had discovered (but were unappreciated) the most wonderful and helpful things for the uplifting of the teaching force, and, incidentally, the youth of the country. Had an educational curiosity shop been established by the National Educational Association since 1895, it would contain more real specimens of great wants come to a premature end than any other intellectual museum in the world. There has been afforded an excellent opportunity to observe certain minds wandering among stars, guided by one lightning-bug flash. While many of these sought to do things seldom wise and never important, yet there have been others whose proposals contained far-reaching ideas, and whose investigations have been real contributions to the cause of education.

On the morning of August 1, 1914, this powerful man took his place at his desk to prosecute his work. A few moments later a lifeless body sat where he had been. Never again shall his great spirit thrill us through the strong grip of his hand, nor shall it look out at us from the bright windows of his eyes. What other consolation have we in this loss than in the belief that though this body we touched shall dissolve, our friend continues with us?

As I have recalled my associations with him, I have thought of him as Superintendent Greenwood, Dr. Greenwood, Jim Greenwood, the administrator, scholar, man, and have realized it was Jim Greenwood whom I respected and loved because his great soul made administrative powers and scholastic attainments but means of expressing more effectively his human sympathies. We hesitate to open the sacred portals of his home for fear of trespass, but we have had permission to see him there as he seemed to her who for many years was his coworker in the schools and who was his dear wife in the declining years.

I look upon thy face and think what thou
Hast been to me: My counselor, my guide,
My champion, my star. Of high ideals
Thou wert the nourisher. I had but thee
On earth, and thou wert all the world to me.
And not insensible was I that thou
Couldst liberate my thoughts to wing a flight
In altitudes beyond their wonted reach.

Thy spirit sweet of duty, beauty, truth,
Of human worthiness, of faithfulness,
So high a standard set that common ken
Like mine could rarely apprehend or climb
The space between. I could not keep thy height.

That brow, those steady eyes, those mobile lips,
Those features calm that questioning I scan,
Trust absolute reveal, nor register
A shadow of misgiving or a doubt
That love and faith live on forever more.

Eternal is all good. Ephemeral
Is mortal blight of whatsoever kind.
Then well I know that thou though all unseen,
Art ever near and nearer than we think,
Building us up, bidding us e'er be brave
For service here, nor care for bafflement,
Nor flinch when disappointment stings full sore.
Help us to face with resolution new
The days to come, with courage never crushed
The gleam of thy example to pursue.

BEN BLEWETT

ST. LOUIS, MO.

EDUCATIONAL EVENTS

GIFTS OF THE ROCKEFELLER FOUNDATION

THE Rockefeller Foundation has prepared for the commission on industrial relations and has made public a complete report of the gifts, pledges and disbursements of the institution from the date of establishment. The report shows the following gifts:

War relief (food, stipends for Belgian professors, medical supplies and administrative expenses)	$1,009,613.76
International Health Commission	142,467.76
Investigation of industrial relations	5,292.13
Medical work in China	39,270.92
Purchase of bird refuge in Louisiana	223,574.77
Total	$1,420,218.64

Other gifts and pledges up to February 1, 1915:

December 5, 1913—For Red Cross Civil War memorial headquarters (conditional)	$100,000
December 20, 1913—For support of laboratory and clinics of the New York City Department of Health	8,640
January 21, 1914—To the American Academy in Rome	100,000

To the American Red Cross for relief in Bulgaria 10,000
January 29, 1914—To the Japanese Relief Society for the calamities in the northeastern districts and Kuyshu 10,000
April 16, 1914—To the Committee of Reference and Counsel of the Annual Foreign Missions' Conference of North America 450,000
May 27, 1914—To the Bureau of Municipal Research 30,000
To the American Association for the Conservation of Vision (conditional) 25,000
To Wellesley College for buildings and endowment (conditional)..... 750,000
August 13, 1914—To the American Red Cross to send physicians and nurses to Europe 10,000
To Dr. Alexis Carrel for the relief of sick and wounded in Europe 10,000
To the New York Association for Improving the Condition of the Poor, to help provide pensions for dependent widows with families 200,000
September 25, 1914—To the New York Milk Committee 5,000
October 21, 1914—To the Bureau of Municipal Research, for studies preparatory to the Constitutional Convention. 10,000
December 3, 1914—To the Association for Improving the Condition of the Poor, in view of unusual distress 25,000
To the Charity Organization Society, in view of unusual distress 10,000
To the Brooklyn Bureau of Charities, in view of unusual distress 10,000

Gifts which have been made at Mr. Rockefeller's personal requisitions since the foundation was established are as follows:

May 4, 1914—To the New York general committee on the Newfoundland sealing disaster $1,000
To the International Committee of Young Men's Christian Associations, for foreign use 32,500
To the New York Milk Committee... 4,000
To the Baptist Union of Western Canada, for home missionary work. 10,000
To the Society for Italian Immigrants 750
To the Boy Scouts of America 5,000
To the Prison Association of New York 500
To the Association for Improving the Condition of the Poor 6,000
To the Brooklyn Bureau of Charities. 2,000
To the New York Child Labor Committee 300
To the National Highways Protective Society 250
To V. Everit Macy, for salary and expenses of a trained agent to work among poor children of Westchester County under the auspices of the State Charities Aid Association.... 1,200
To V. Everit Macy, Superintendent of the Poor, Westchester County, for eugenic investigator 900
May 5, 1914—To Dr. Charles B. Davenport to provide six field workers in eugenics to work in state institutions. 5,400
May 12, 1914—To the Public Education Association (conditional) 35,000
May 14, 1914—To the Laymen's Missionary Movement 5,000
May 15, 1914—To the National Child Labor Committee 1,500
June 3, 1914—To the Baptist Ministers' Home Society 200
To the Federal Council of the Churches of Christ in America 500
June 5, 1914—To the Charity Organization Society 6,000
June 17, 1914—To the George Junior Republic Association 2,000
June 19, 1914—To the State Charities Aid Association 2,000
June 24, 1914—To the Rockefeller Institute for Medical Research for land, buildings, equipment and endowment...2,550,000
June 26, 1914—To the Girls' Branch of the Public School Athletic League 300
June 30, 1914—To the New Jersey Baptist Convention 1,000
July 8, 1914—To the Salem Fire Relief Fund 10,000
July 29, 1914—To the Honest Ballot Association 1,000
August 17, 1914—To the Young Men's Christian Association, University of Michigan, for land, building and equipment (conditional) 60,000
August 18, 1914—To the Brooklyn Young Men's Christian Association, for land and buildings 300,000
For the Young Women's Christian Association of Cleveland 1,000
August 25, 1914—To the American Baptist Foreign Mission Society 50,000
September 9, 1914—To the Alta Social Settlement, Cleveland 14,500
September 11, 1914—To the Legal Aid Society of New York 1,000
September 29, 1914—To the Cleveland Federation for Charity and Philanthropy, Cleveland 1,000
October 3, 1914—To the Public School Athletic League, New York 500
October 21, 1914—To the Blue Ridge Association, to maintain the Social Service Summer School (conditional) 3,000
November 2, 1914—To the International Young Men's Christian Association College at Springfield, Mass. 2,000
November 5, 1914—To the Girls' Branch of the Public School Athletic League, New York 200
To the Police Society of Westchester County, Inc. 1,000
November 18, 1914—To the American Female Guardian Society and Home for the Friendless 500

To the Brooklyn Young Men's Christian Association	1,000
November 20, 1914—To the Religious Education Association	750
November 23, 1914—To the National Board of the Young Women's Christian Association	10,000
To the Charity Organization Society Committee on the Prevention of Tuberculosis for the Red Cross Christmas Seal Fund	500
November 30, 1914—To the Young Men's Christian Association of New York	3,000
December 17, 1914—To the National League on Urban Conditions Among Negroes	3,500
To Whittier House, Jersey City	1,000
December 18, 1914—To the Parks and Playgrounds Association	250
December 30, 1914—To the International Committee of Young Men's Christian Associations	15,000
To the Hospital Saturday and Sunday Association	500
January 11, 1915—To the Travelers' Aid Society	100
To the Working Women's Protective Union	50
To the American Baptist Foreign Mission Society	5,000
For food for destitute New York pupils	2,500
January 19, 1915—To the Tarrytown Young Men's Christian Association	500

WORK IN EDUCATION AT THE UNIVERSITY OF NORTH CAROLINA

The faculty of the University of North Carolina recently voted that the School of Education should be allowed to confer a new degree to be entitled the degree of bachelor of arts in education. In order to obtain this degree a student must have passed through a curriculum which, in its main features, is as follows:

During the freshman year he pursues the required work for any one of the three regular A.B. courses with the exception that the hour a week now devoted to public speaking must be devoted to the study of a few of the simpler educational problems in a course of lectures conducted by the different members of the faculty of the School of Education.

In the sophomore year three hours are devoted to the study of education and twelve to fifteen hours to the usual academic subjects; the course still closely parallels the usual A.B. courses. The course in education for this year deals especially with the problems which arise in connection with the elementary schools, in order to meet the needs of a large number of men, who at the end of their sophomore year, leave college and teach in the rural schools of the state.

During junior and senior years the student devotes eight to nine hours to the study of education and the same amount of time to academic subjects. The work in education during these last two years consists, for the most part, of required courses, but provision is made for elective work to satisfy different classes of men. The required subjects are: educational psychology, high-school organization and administration, rural administration and supervision, observation work with discussion of the principles involved and school supervision.

The course and the degree have been established to meet the increasing demand for professionally trained teachers. The main part of the student's time will be given to his academic work, but in the last two years of the course the time given to technical training will demand a full half of his attention.

ENROLLMENT IN HIGH-SCHOOL COURSES IN MISSOURI

A study recently made by Mr. W. J. Bray, professor of chemistry, State Normal School, Kirksville, Mo., an abstract of which is supplied by the Bureau of Education, reveals the following facts regarding the enrollment in the different subjects taught in the first-class high schools of Missouri:

Agriculture is the only recognized high-school science that shows any gain in its percentage of enrollment for the nine years from 1905 to 1914, while the enrollment in science, as a whole, excluding domestic science, has declined from 64.4 per cent. to 49.2 per cent. This seems remarkable in view of the fact that nine years ago comparatively few science teachers in the high schools of Missouri were college trained and that the schools are now much better equipped for teaching science. In 1905, $5 per pupil enrolled in science classes was invested in science-teaching equipment; in 1913, $15.75 was so invested.

Professor Bray concludes that the reason science is not holding its own is because, as taught, it is failing to meet the popular demand for a practical usable education. He points out that the only exception to this is the subject of agriculture, which has gained nearly 300 per cent. in enrollment within the last nine years, and that there is no room in the secondary school for science for science's sake.

Domestic science, though not taught as a science, has had a healthy growth since its introduction into the high schools of Missouri in 1906, the enrollment having increased from 9.3 per cent. to 13.3 per cent.

Algebra, both first and second year, has a smaller per cent. of students than formerly. Solid geometry and trigonometry both show a decrease. Professor Bray thinks that the 5 per cent. decrease in all mathematics courses indicates a state of unrest and a demand for courses that will contribute more information bearing on the practical affairs of life without sacrificing fundamental mathematical principles or ideals.

History courses in the Missouri high schools are more than holding their own. Ancient history alone shows any decrease in percentage of enrollment. All other history courses show substantial gains.

The enrollment in the Latin courses has decreased from 50.8 per cent. to 40 per cent. since 1905. German has held its own. It is pointed out that one of the possible reasons German has not made greater increase is because the subject has not been introduced into the high-school curricula as rapidly as the number of first-class high schools has increased. This fact may also have tended to lower the percentage in some other courses, such as music, manual training, and drawing.

The commercial subjects increased from 9.4 per cent. in 1905 to 20.9 per cent. in 1913. Stenography and typewriting show an increase from 2.5 per cent. to 12.8 per cent., while bookkeeping shows a gain of from only 6.9 per cent. to 8.1 per cent.

The introduction of teacher-training courses has caused remarkable growth in the enrollment in the subject of pedagogy. In 1908, .5 per cent. were enrolled in the subject; in 1913, 9.5 per cent.

EDUCATIONAL NOTES AND NEWS

PRESIDENT ARTHUR T. HADLEY, of Yale University, has been invited to make the address at the Vassar Commencement this year.

DR. FRANK J. GOODNOW, president of the Johns Hopkins University, made the address before the Schoolmasters' Association of New York and vicinity on March 19. His subject was "Oriental Education."

A BEREA COLLEGE meeting was held in Washington on February 24, when addresses were made by Justice Hughes, who presided, and the president of the United States. Addresses were also made by Dr. William Goodell Frost, president of the college; Dr. Frederick C. Bonser, of Teachers College, Columbia University, and Dr. Hamilton W. Mabie, of *The Outlook*.

"THE Education of Women in England in the Eighteenth Century" was the subject of the convocation address delivered at the ninety-fourth convocation of the University of Chicago on March 16, by Professor Myra Reynolds, of the department of English in the university.

THE board of estimate of New York City has voted the payment of $10,000 each to Dean Herman Schneider of the University of Cincinnati and Mr. William Wirt, superintendent of schools at Gary, Ind., for ten weeks' services in introducing cooperative, vocational and prevocational systems into the New York schools, in accordance with the arrangements made by the board of education. The board also approved an appropriation of $107,000 to continue the work begun by these experts.

THE General Education Board has accepted the invitation of the Maryland Educational Survey Commission to make a complete study of the educational needs, organization and facilities of the State of Maryland, with a view to improving the system. The work of the board, which will be under the direction of its secretaries, will begin at once. Dr. Frank

P. Bachman will be in immediate charge of the work in Maryland. Any expense above the $5,000 appropriated for the purpose by the Maryland legislature will be met by the General Education Board.

PRESIDENT RAYMOND A. PEARSON, of the State Agricultural College at Ames, Iowa, has decided not to accept the offer of Governor Whitman, of New York, to become state commissioner of agriculture to succeed Mr. Calvin Hudson. Dr. Pearson was commissioner of agriculture under Governor Hughes.

DR. JANET T. HOWELL, daughter of Dr. William Howell, professor of physiology in the John Hopkins Medical School has been awarded the Sarah Berliner Fellowship for Women. This fellowship carries with it a gift of $1,000 to enable the recipient to engage in research work in physics, chemistry or biology. Dr. Howell received the A.B. from Bryn Mawr College in 1910, and the Ph.D. from the Johns Hopkins University in 1913. She was holder of the Helen Schaffer Huff research fellowship in physics at Bryn Mawr College during 1913–14 and this year she holds the position of lecturer in physics at Bryn Mawr College, taking the place of Professor James Barnes.

MR. NILES CARPENTER, a graduate of the University of Illinois in the class of 1912, is announced as a prize winner in the 1914 prize essay contest endowed by Hart, Schaffner & Marx. Mr. Carpenter who is now attending Northwestern University was awarded the $200 prize on his essay entitled "Comparison of the financial opportunities of the General Electric Company and the Westinghouse Electric and Manufacturing Company during the panic of 1907 and the period preceding."

JAMES GREENLEAF CROSWELL, for twenty-eight years headmaster of the Brearley School at 60 East Sixty-third Street, New York City, has died at the age of sixty-three years. Mr. Croswell graduated from Harvard College in 1873 and was assistant professor of Greek and Latin there from 1883 to 1887.

MR. JOHN T. RAY, principal of the Ryerson School in Chicago, prominent in educational work and active in the movement for non-partisan local government in his city, has died there, at the age of sixty-three years.

HENRY HINSDALE BUTLER, A.B. (Yale, '66), for many years master of the high school, Belmont, Mass., died on March 14.

THE Rev. Selden Jennings Coffin, Ph.D., who had been a member of the Lafayette College faculty for forty years, retiring in 1904, died at his home on the campus at Easton, on March 15, in his seventy-seventh year. He was a son of James H. Coffin, professor at Lafayette College and distinguished for his contributions to meteorology. Dr. Selden Coffin was professor of mathematics and astronomy from 1872 to 1886, when he became registrar of the college.

DR. T. WESLEY MILLS, emeritus professor of physiology in McGill University, died in London on February 14.

PROFESSOR JAMES GEIKIE, the distinguished geologist, died in Edinburgh, on March 2, in his seventy-sixth year. He entered the British Geological Survey in 1861 and was called to the Murchison chair of geology at Edinburgh University in 1882, succeeding his brother, Sir Archibald Geikie.

SIR JAMES DONALDSON, vice-chancellor and principal of the University of St. Andrews, known for his publications on education and on classical subjects, died on March 10, at the age of eighty-four years.

DR. JAKOB SCHIPPER, emeritus professor of English in the University of Vienna, has died at the age of seventy-three years.

AT the Massachusetts Institute of Technology Thomas G. Goodwin has been appointed instructor in English, replacing Mr. Caro, who is on leave for the second term. Mr. Goodwin is a Harvard graduate of 1912 who has spent the interim as instructor in the University of Illinois. Mr. Caro went some time ago to France, offering his services in some one of the civilian capacities in the hospitals.

ASSOCIATE PROFESSOR J. M. FULLER, of the dairy husbandry department of South Dakota State College, has accepted a position as head of a like department in the Oklahoma

Agricultural College. He leaves an excellent record as teacher and student adviser.

ANNOUNCEMENT is made by the board of trustees of the University of Chicago of the appointment of two new members to the faculties of the university—Dr. Martin Sprengling, of Harvard University, to be assistant professor of Arabic and Hebrew in the department of Semitic languages and literatures, and Mr. Morris M. Wells, of the university of Illinois, to be instructor in the department of zoology. Dr. Sprengling was for three years a graduate student in the University of Chicago, and later held a fellowship for two years in the department of Biblical and patristic Greek. Mr. Wells was also a graduate student at the University of Chicago for two years, and receives the doctor's degree from the University of Illinois this spring.

MR. ROBERT CLAUSON, A.B. (Cornell, '02), formerly a teacher at Angeles, Pampanga, Philippine Islands, is now acting division superintendent of schools in Palawan Province, Philippines, with headquarters at Cuyo.

LAST week's lecture in the Washington University public course was delivered on Monday, March 8, by Professor F. W. Shipley on the subject "Julius Cæsar." The preceding lecture, that on "Friedrich Nietzsche," by Professor Otto Heller, brought out an attendance so largely in excess of the capacity of the lecture hall that it will probably be repeated in the near future either under the auspices of the university or for some organization in the city that has a large enough auditorium at its disposal. Besides this lecture Professor Heller has recently spoken before the Ethical Society on "Goethe's ideal of Culture," and before the Town Club on "Maeterlinck, a Study in Mysticism." He has also been invited to lecture at the National Convention of the Drama League of America at Detroit, in April, taking part during the convention in the Conference on Criteria and Standards of Dramatic Criticism and speaking at the banquet.

THE New England Association of Chemistry Teachers held its fifty-second regular meeting on February 27, at the Roxbury Latin School, when an address entitled "Some possible items, new and old, for the course in elementary chemistry," was given by Professor Alexander Smith, head of the department of chemistry in Columbia University. At the request of the executive committee Professor Smith discussed several topics, such as: Action of air in the Bunsen burner flame; colloidal suspensions; cause of valence, electrons; the shortest route to atomic weights; the distinction between physical and chemical change; and a new view of a crystalline solid. Several experiments were performed to illustrate these subjects. The members who were present in large numbers discussed the value of these topics in an elementary course in chemistry.

DISCUSSION AND CORRESPONDENCE

FURTHER DISCUSSION OF GENERAL SCIENCE

THE wide publicity given to the paper by John G. Coulter, entitled "A Four-Year Course in Science in the High Schools" which appeared in SCHOOL AND SOCIETY, Vol. I., pp. 226–34, and elsewhere, requires that some attention be given to it, and to the proposed reorganization of high-school science. The chief theme of the paper seems to be found in the author's advocacy of a particular arrangement of materials in a two-year course in science, which arrangement he conceives to be menaced by the present general interest in one-year general science courses. The proposed arrangement is in this paper placed in such close relation with the report of the biology committee of the National Education Association Commission on Reorganization of Secondary Education, that an uncritical reader might suppose it to be the work of that committee. Closer reading of the paper discloses the fact that the proposed arrangement does not emanate from the committee. It is merely "suggested" by a "phrase of the committee." It must therefore be considered

as a personal proposal and not as a product of the action of the committee. As a matter of fact, something more than two columns of the discussion on pages 230 and 231 may be recognized as taken almost unchanged from an anonymous "N. E. A. Report on High-school Science" which was published in *School Science and Mathematics*, November, 1914, pp. 732 and 733, and repudiated by the chairman of the N. E. A. committee in the December issue of the same magazine, page 820.

This proposal purports to represent a distinct "change from the *status quo*" intended to assist in remedying the "serious faults in the present status of the science courses" which "have long been conceded."

The proposal includes four half-year courses arranged as follows: physical environment, plants (plant life and uses), animals ("soundly organized as zoology"), and man ("hygiene and sanitation emphasized"). So far as arrangement of material goes, the novelty of this proposition is not striking. Various combinations of the biological subjects have been administered in the earlier years of the high schools almost as long as biological science has had a place on the high-school programs. In later years each of several books has presented these materials bound in the same cover, as, for example, the excellent books by Peabody and Hunt, by Hunter and by Bigelow. The two-year requirement appeared in the report of the Central Association committee more than a year ago. The only feature which has even a remote claim to consideration as a "change from the *status quo*" is the insertion of "physical environment" regarding which the author admits that he stands in "defense of a kind of inorganic general science." The study of physical phenomena as an introduction to a course in some other science, while not in general practise, is not a novelty. The high school at Oak Park, Illinois, has for sixteen years maintained a first-year course in which a considerable study of physical material composes the introductory part of the course, and the outline of this course has been in print since 1911. Miss Bertha Clark published a physical-chemical text of general science three years ago, and other text-books of the same general nature have been issued. The general idea of a preparatory study of certain physical phenomena is even older, as may be seen by reference to the first chapters of Hinman's "Physical Geography," published in 1888.

With regard to this "inorganic general science" one is tempted to inquire how it is that the boundary lines of the several sciences, the inviolability of which is so strongly urged by this writer, have suddenly become negligible when we pass beyond the bounds of biology; and whether the "physicists and physiographers" were consulted before making the assertion that "in inorganic phenomena we find no unity equally serviceable" with that inherent in biology.

As to the internal organization of these four half-years, no outline is given and all the data which may be gathered from the paper are far too meager to enable one to understand what sort of organization is proposed. The relation of the "inorganic general science" to the other three half-units remains, therefore, the sole constructive proposal which the writer is able to distinguish in this article. Since the advocates of general science are quite willing that it be followed by biological science and have practised this arrangement for some years, and while Mr. Coulter agrees that "first-year science should have a strongly *general* nature," and characterizes his own proposal as "a kind of general science," the disagreement appears to lie in but one point. Shall the introductory science be a full year of general science, including such biology as is judged desirable, or shall it be a half year of general science with no biology? In either case the high-school pupil appears to be face to face with this "travesty of science" which menaces his opportunity to enjoy the fruits of a system whose serious faults "have long been conceded."

It should be noted in passing that advocates of general science are not opponents of science teaching nor antagonists of the type of organization which is characteristic of the spe-

cial sciences. In fact most of them are engaged in teaching more or less orthodox courses in the later three years of the high school. They are finding that while general science proves interesting and profitable as a year's course in science, it at the same time furnishes a needed transition from the grades to the more mature special organization and, possibly for that reason, increases the whole number of pupils taking science.

Those who have been engaged in the task of organizing courses in general science and who have checked their work by trial with classes possibly are entitled to an opinion regarding the difficulties of such organization and the time limits within which it can be administered to best advantage. As is emphasized in the paper under discussion, practically all such persons have proposed a one-year course. When a similar complete and detailed outline of a half unit of "inorganic general science" has been presented by Mr. Coulter as the result of some one's careful trial in the classroom a more constructive discussion of his proposal will be possible. Likewise, when a similar organization for the three half-units of biology shall have been made public, it will doubtless receive attention from teachers of botany, zoology and human physiology. In the meantime, the situation will be made much clearer if Mr. Coulter will enlighten us with the data to which he refers so frequently but does not cite at all. The "cold facts" upon a "careful consideration" of which this paper is said to be based do not appear to be common property. Such data would be peculiarly useful to the teachers and administrative officers who may now be considering the introduction of general science courses for next year.

If the two paragraphs in column 2, page 229, fairly represent the state of general science courses throughout the country, the author certainly owes it to the educational community to put abundant and convincing objective data before the public. If "analysis has shown the success" of general science "to be dubious," in any considerable number of places where it has been reported successful, the steps in the analysis ought to be presented for the information of students of education. Does Mr. Coulter mean to assert regarding the advocates of general science, as a group, that their aims are limited to a desire to "interest children in explanations of common phenomena and to lay an effective foundation for the study of special sciences?" If so, and his statement appears to imply this, where is the avowal of these exclusive aims to be found? And would it not be worth while to demonstrate, instead of merely asserting, that general science is a course which "frankly abandons the principles of science"?

The advocates of general science do indeed take account of the interests of children, and if this is heresy they are willing to abide the consequences, but where does the author find authority for the notion that they wholly vacate their own judgment to that of the pupil, making him "both judge and jury"?

We should doubtless be much enlightened if the "abundant evidence" that "may be cited which indicates that disagreement among the teachers has chiefly arisen from the effort to agree upon the nature of first-year science," should be actually produced along with equally abundant evidence that the teachers will agree any better upon a half unit than upon a full unit of general science. Since there are said to be certain facts relative to the teacher, and to this problem which are so obvious that "any one who goes into the matter and gets the cold facts will quickly perceive the cogency" of the author's argument, why not let us have these essentially important facts? What data have enabled the author to make such close analysis of the relatively complex problem of science teaching that he now knows that "the 'failures' in science instruction have been due to faults in teaching and to faults in choice of subject-matter rather than to faults in principles of organization"?

In what quarters has psychological knowledge progressed so far that we now know regarding the first-year pupil, for the first year is principally concerned, that "high-school pupils have reached the age at which organization of data appeals to them," and what is

the nature of the cold facts upon which this generalization rests?

It may be permitted to suggest that in a discussion of educational principles it is eminently desirable for one who makes such positive assertions as those quoted, and others which might be quoted, to substantiate them with the facts.

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QUOTATIONS

A FOREIGN VIEW OF COMPETITIVE ATHLETICS

In order to discover undeveloped athletic "talent" among the students of the high schools and universities of the German Empire, in anticipation of their being trained for the projected Olympic Games, a clever and presumably effective scheme was proposed. The German committee for the Olympiad suggested the institution of competitive games under the auspices of athletic associations in many places. The participants were to be students without previous special athletic training who would be enabled to demonstrate an inherent fitness in an open competition. The events were to include swimming matches, running and jumping contests of various orders, such as 100, 400 and 1,500 meter races, and numerous other exercises. Although it was assumed that such contests of the untrained would tend to spread broadcast the appreciation of the importance of physical exercise, yet the foremost underlying intent of the plan was undoubtedly to discover the exceptional candidate in order that he could subsequently be trained for the development of latent possibilities of athletic preeminence. From the latter point of view the aim of the German committee was well conceived.

The experts of the Prussian government have not sanctioned the proposed plan. It was submitted to the physiologist Rubner and the clinician Kraus, professors in the University of Berlin. In their report they do not belittle the hygienic value of athletic sports, and they admit that competitive games frequently serve to awaken interest in the need of physical education and improved health through exercise. It is contended, however, that any system of athletics which finds its best expression in competition, and has as its chief end the development of athletic supremacy, fails to meet the real hygienic needs of youth and to serve for the proper perfection of the body. The excesses and the evils of athletics which have grown up in England and America, where this form of sport has received its greatest impetus, are brought home to the German committee. They are reminded that here the organization of competitive athletics is attended with an undue sacrifice of time at the expense of the intellectual pursuits. The contests degenerate into a public entertainment with all the drawbacks of the arena. The development of the body is carried out along lines of extreme specialization.

Physical exercise, if it is to be of real hygienic service, has an object quite different from the preparation of a specially equipped individual trained for a game. Exercise is intended to benefit all the muscles and all the pupils. Its aim is to advance the bodily equipment of the great numbers of our youth; otherwise our so-called physical education fails to serve the community at large. Athletic prowess necessitates taxing the organism to the very limit of its endurance; it is a dangerous expedient and should never become an experiment. The idea of athletic competition must not be transplanted to the schools, where it is certain to endanger the health of the average group of students.

The conclusions of Rubner and Kraus are not only to be endorsed, but deserve widespread publication because they ought to carry weight as sane judgments of competent observers. It does not matter here what the individual exercises are to which the German experts specifically object, and which the government is thus committed to exclude. They comprise particularly such trials as may unduly tax the heart and lungs. School authorities are reminded that races for schoolboys must not be made too strenuous; the exertion must not become too prolonged or too severe. The 400 and 1,500 meter races, for example, are forbidden. Pupils with heart affections,

anemic individuals and young persons with impaired respiratory function are warned against participation. Exercise is intended to benefit, not to injure the individual. In the army and navy the more difficult forms of sport are permissible; but here we are dealing with a chosen group of well-trained subjects. They are prepared for the task of exertion.

Let no one construe such checks on competitive games as a movement against physical training and gymnastics. The latter should receive every encouragement that a rational system deserves; but the propaganda for a recognition of the value of bodily exercise carried out in any suitable form must be based on a system of health-promoting practises. Competition belongs to the specialist, who must insure himself against the consequences. He should not be allowed to set the standard for athletic sports.—*Journal of the American Medical Association.*

BOOKS AND LITERATURE

PRESENT TENDENCIES IN SCIENCE TEACHING

II

The book of Professors Lloyd and Bigelow represents the same tendency as is shown in Professor Smith's work, and has similar characteristics. The problem method and the humanistic point of view are consistently advocated and well illustrated and explained. The importance of approaching each portion of the subjects of zoology and botany from the functional point of view and of subordinating logical organization to the humanistic, in presentation, is clearly brought out. While the book is not entirely free from the vague expressions about training various "powers" which were characteristic of the period when the theory of formal discipline and generalized powers was widely held, its teaching clearly repudiates that doctrine, by implication at least if not by categorical denial.

The authors indicate unmistakably that scientific abilities, which are essentially such abilities as are possessed by efficient workers in all lines, but refined and reduced to consciously methodical mental processes, are to be obtained only by the formation of habits and ideals through constant practise on scientific problems; that is to say, practise in observing with a definite problem in mind, practise in keeping the mind open to rival suggestions or hypotheses, practise in using carefully guarded reasoning in passing by inductive inference from particular cases to general principles, and in deducing particular implications from such principles, and practise in testing out hypotheses so arrived at and selected by comparing their implications with the facts developed by experiment and further observation. In other words, these authors imply that the training process can result in ability to think and act logically at all times only by giving practise in logical thinking and procedure so as to form logical habits and attitudes of mind *and by inculcating ideals that will help the student to carry over such logical attitudes and make such modifications of the habitual procedure as may be necessary in dealing with new situations.* Like Professor Armstrong, Professor Smith, and the writers in "Broad Lines in Science Teaching," Professors Lloyd and Bigelow show by copious illustration the kinds of instruction in classroom and laboratory through which such habits and ideals may be expected to be formed in connection with experimental studies of the particular kinds of scientific subject-matter and materials with which botany and zoology deal.

President Sutherland's book on the teaching of geography takes a further step forward in its freedom from any vestiges of the old doctrine of formal discipline by either word or implication. His book, though intended for teachers of elementary geography is a safe guide for high-school teachers. He stands unequivocally for the problem method and the humanistic viewpoint, and like the other authors he leaves no excuse to the teacher for not trying the method and adopting the viewpoint; for he gives all the information that is necessary for economically equipping a geographical class room and laboratory and making use of it in teaching geography by the scientific method. Since the publication of this book and the admirable monograph for

high-school teachers on the same subject by Professor Whitbeck, of the University of Wisconsin, there is no longer any valid excuse for teaching physical geography by the prevailing text-book method. The reason why this subject is behind others in the matter of remaining largely a text-book subject is that school authorities very generally assume, as in the case of history, that anybody who can read English can teach it, when, as a matter of fact, both laboratory training and field training are absolutely essential to competency in teaching it.

Of Professor Mann's book it is not overstating the case to say that it marks a distinct epoch in the history of books bearing especially on science teaching. It leaves the vague terminologies of discredited systems of psychology and educational philosophy forever behind, and thus sets a new standard for pedagogical books on specific school subjects. Professor Mann writes not only with the knowledge of a trained and seasoned physicist, but with a thorough grasp on the modern scientific and social conception of the aims and functions of education in a democratic civilization, and a clear comprehension of the implications that follow from the recent research results of educational psychology. He has spent a great deal of time in visiting high schools, and by correspondence and research has made himself familiar with methods and conditions of physics teaching in many different sections of the country; and he therefore knows the conditions under which attempts to apply educational theory and reach educational aims must be made. Professor Mann begins his book with examples of some of the muddy ideas and twisted thinking that are well known to be only too common among the output of the prevailing high-school courses in physics, and raises questions about the meaning of the words in the popular slogan, "Physics should be brought close to the daily lives of the pupils," which brings the reader at once face to face with some of the unsettled fundamental questions of physics, of science in general, and of psychology and education. These questions are raised for the purpose of "inducing a proper state of open-mindedness" on the part of the reader, in preparation for finding a basis from which the pedagogical problem that physics teachers must solve may be defined and apprehended. This is necessary because the apprehension, by teachers, of a clear statement of just wherein this problem lies, and what its essential problematic features are, is the first and indispensable step toward solving it.

In the first four chapters the origin and history of the public high school is rapidly sketched; and the gradual departure from its true function of this institution, originally founded and supported by the public to be a school for all the people, is clearly traced. The departure is shown to be due to the influence of the doctrine of formal discipline and the theory that the contents and methods of studies that have been thought by college authorities to afford the best preparation for college also constitute the best preparation for life. These two theories, united and promoted by the authority of the National Education Association and the College Entrance Board during the period from 1892 to about 1902, became the accepted theories of school administrators. It resulted in the shaping of courses of study to fit the ideas of men who in general have had little knowledge and less interest in the high schools with relation to their larger social and educational functions, but have given thought and concern mainly to the high schools as the sources from which they gained their supplies of students. Thus the pressure of college examinations and certificate requirements has resulted in institutionalizing a body of subject-matter and a method of teaching that was aimed toward satisfying the requirements of college faculties rather than toward giving a broad and efficient training for grappling successfully with all kinds of life problems.

After noting the present very widespread and vigorous, though not by any means general, reaction among school men against the control of high-school curricula and methods through the agencies that administer college-entrance requirements, and noting the tend-

ency to establish courses of greater humanistic and vocational value than those that until very recently have held full sway, the author sketches rapidly but clearly the changes in content and method of high-school physics from the natural philosophy of the third quarter of the nineteenth century down to the "prescribed physics" of to-day. "Natural philosophy" dealt with the behavior of familiar things and forces in a descriptive and qualitative way—vague, it is true, but concrete, at least, and full of human interest. The kind of physics that is represented in most text-books, laboratory manuals and syllabi to-day is shown by extracts from these sources to be largely aimed at training in such abstract performances as finding "the velocity of *a body* having uniformly accelerated velocity at the end of *th* second," or the force in dynes required to give *a body* whose mass is 20 grams an acceleration of 45 cm. per second per second, or discoursing on the general properties of the ether and the kind of ether motion in light-waves before examining any of the common phenomena of light, or finding the relative resistance of different metals referred to copper. This is the sort of thing that very generally is being done instead of, say, measuring the relative efficiencies of two sets of pulleys bought from a hardware store to find out which is the better, or instead of working among interesting light phenomena until the facts become familiar and curiosity aroused by the interesting behavior of light cries out for theories to explain it, or instead of measuring the resistance of a real incandescent lamp and a commercial wire in a real circuit to find out whether a given electrical pressure at the mains will send through it a current sufficient to bring it up to its rated candle power. In other words, *the almost universal tendency of current text-books in physics is to present the general before the particular, the strange and unfamiliar before the common and familiar, the far before the near, the abstract before the concrete.* Text-books, syllabi and college examinations alike give the cue to the teacher to make the approach deductive, didactic, abstract, instead of hueristic, inductive and concrete. *The attitude is that of setting up a thesis and supporting it with ex parte argument,* rather than of finding in many simple and familiar problems, general principles that are useful in solving other problems. The whole trend is shown to be toward hammering in the subject-matter in treatise form instead of toward giving practise in the methods by which the subject-matter of science is acquired, organized and used, and thus by means of such practise forming association bonds between the principles and methods of science, on the one hand, and the manifold situations of daily life on the other hand wherein the principles must be applied in dealing with the material facts that make up the situations.

In the next three chapters the origin and history of physics are briefly traced, and its method described. It is here shown that physics has sprung, on the one hand, from the knowledge gained through experience in the industries, and on the other hand from the spirit of wonder, which Dewey says is "the emotional outgoing of the mind toward the universe, the sole spring which can take a man beyond his subjective states and put him in that active relation with the world which is the sole condition of getting at its meaning." Not only have the needs of industry furnished the problems that demanded the methods of science for their solution, but the industries brought about the necessary familiarity with the facts of those problems; and the wealth and leisure which it made possible furnished the opportunity for men inspired by the spirit of wonder to carry on researches and perfect the scientific method. Thus science and industry at bottom are one. "If industry quits when an expedient rule of thumb for the needs of the immediate situation has been found, while science continues until the need of a more general rule or law is discovered, is not this a difference in degree rather than in kind?" Hence *the approach to physical principles should be made through concrete cases, chosen from the pupil's environment; and the principles, when found, should be applied in other concrete cases where it helps to solve industrial problems.* In these chapters the logic and psychology of the scien-

tific method are made clear and interesting by tracing genetically the development of some of the most important and fundamental scientific ideas and principles; and the foundation is laid for a constructive pedagogical program.

Chapter VIII. on "The Discipline of Physics" is a lucid and convincing presentation of what modern psychology may lead us to expect of physics when properly taught so as to give practise in the scientific method, and of the principles by which we must be guided in our teaching if we are to hope for the realization of our expectations. It is a succinct summary of the doctrine of transfer of training by common elements and ideals as applied to the subject-matter and method of physics. This doctrine points toward less reliance on didactic methods and the accumulation of information in treatise order and form, and toward greater reliance on practise in dealing with "forked-road situations" requiring knowledge for their successful solution.

While Professor Mann shows that the old didactic methods, borrowed from the classics and mathematics, and still so widely and confidently relied on, very generally failed to give training in thinking ability and resourcefulness that is carried over and successfully applied in fields outside the schoolroom, he makes no absurd claims that the heuristic methods toward which the modern theory of discipline points will certainly do so. His plea is that since the old methods are discredited both by their failure to make good and by the obvious implications of facts discovered in recent psychological experiments, *the time has come to try out new methods and submit them to fair and impartial tests* in order that we may in time learn whether they are practicable or impracticable, and whether their effects are good or bad, or neutral. He entertains no fond illusions, advocates no cherished fads, and prophesies no educational millenium wherein the differences in inborn interests and capacities shall be ironed out and everybody shall think effectively on all kinds of problems. He only pleads with teachers of physics *that they use the scientific attitude and mode of procedure, employing hypothesis, observation, experiment and measurement in studying their own methods of dealing with pupils and the changes that these methods produce* in specific abilities, habits, ideals and attitudes of mind. Furthermore, he emphatically points out that as a necessary permissive condition for this program, detailed syllabi, enjoined on the schools by what Professor Hall, writing in 1892 called the "authority of official utterance," must be disregarded, and systems of administration, wherever they are hampering free and open-minded experimentation, must either "loosen up" or keep their hands wholly off.

He further calls attention to the important fact that all the texts extensively used must (for reasons well known to authors and publishers if not to the public) cover completely the ground blocked out by the syllabi. Hence each one of these accepted text-books contains in the neighborhood of 575 numbered paragraphs, each of which embodies one or more new ideas. "Since the 'unit' in physics is defined as 120 hours of class work, *the teacher . . . has about twelve and a half minutes for each paragraph. In this time he must present his illustrative material, his demonstrations, his questions, his laboratory work, and his numerical problems.* This condition reduces well nigh to zero the chances for needed repetition, informal discussion, and the bringing in of neighborhood materials by way of introduction. It is useless to urge the teacher to skip paragraphs, for the argument is usually so logically arranged that the omission of paragraphs renders the subject even more unintelligible." The writer may be permitted to add that the teachers very generally do not *dare* to omit much of the material because it is likely to appear in college or regents' examinations, and they fear *local criticism* in case their pupils should fail in these examinations. This is not an academic conjecture, but is a statement of fact ascertained by five years of observation in the high schools of a state which is perhaps more nearly free from real reasons for fearing "college domination" or the interference of bureaucratic agencies than any in the union. *The obvious conclusion is that the*

number of topics treated in the text-books must be diminished before much experimenting can go on.

The remaining four chapters of Professor Mann's book deal with the statement and management of the general problem of how to try out and test the methods toward which both psychological theory and recent improved practise in some localities point as being the most likely to yield better results.

In proposing variations for testing and selection in the proposed process of evolution the author indicates in broad outline what kinds of subject-matter and methods would seem to have been proved unsuitable for high school pupils, and should therefore be omitted or reserved for a more advanced stage of study, and what in the light of the discussion of the previous chapters, are likely to be best worth trying out. He gives an abundance of suggestions, sample problems, modes of attack, and general principles to guide the teacher in making his own choice of materials and methods, but definitely refuses to give detailed and dogmatic instructions as to just what the teacher should do. His reason for this, stated on page viii of his preface, indicates the general attitude of the book in urging teachers to apply to their own methods of instruction the scientific method of experimenting, testing and approximating. He says, "while it is true that young teachers want to be told in detail just what to do, it is equally true that such detailed instructions are a very serious obstacle to effective work. Every successful teacher must think for himself and adapt his teaching to his special environment. A detailed specification of just what to do is incompatible with the educational ideas expressed in this book."

His suggestions contain unifying ideas for the organization of a more meaningful course of study, hints as to methods of approaching some of the most important physical principles through creating, out of the information which the pupils have gained from their everyday experiences, forked road situations in which real thinking is likely to begin, and in which satisfactory conclusions can be reached only by going into the laboratory and making measurements, or at least experiments (pp. 238 and 255). Many such questions are given as examples (page 257 ff.). The last chapter, on testing results, is one of the most suggestive in this remarkably stimulating book, but it leaves much to be desired, though through no negligence that could be charged to the author's fault. The whole subject of testing school children's abilities is just beginning to take exact scientific form, and only a few studies and methods of testing abilities objectively such as those of Stone and Courtis for arithmetic, Thorndike for handwriting, Buckingham for spelling,[2] and Hillegas[2] for English composition have been made and published. There are as yet no such studies in measuring scientific abilities of high school pupils, though some steps have already been taken in that direction. *In the meantime Professor Mann's last chapter should show teachers how they can at least vary the ordinary examination procedure in ways that will come nearer to obtaining just measurements of their students' progress than the tests now in common use can possibly approach.*

The agitation going on during the last six or eight years in the associations and conferences, and in the educational magazines shows that the leaders in science teaching are wide awake to the need for improvement all along the science line. All this is hopeful as far as the few leaders are concerned, but the situation on the whole is rather discouraging because the number of teachers who are able to go at the problem or even to appreciate its importance is relatively so small. The remedy lies largely with school superintendents, principals and college teachers, and the main purpose of this paper is to call the attention of these men to the fact that they hold in their hands the power to improve the situation. The idea of "college domination," though a real force in the situation, is a bogy man—a specter, which will quickly vanish if a few of the leaders among men who control and administer the public high schools will only get together and formulate a policy outlining the spirit and method

[2] In the Columbia University Studies in Education.

in which the sciences should be taught and put it into the form of a declaration to be submitted for adoption to the departments of secondary education and science of the National Educational Association, and the corresponding departments of their state associations. Such a declaration should recommend changes in the character of college examinations and syllabi that will give the teachers a large amount of liberty in choosing their subject-matter. This can be brought about by reducing the number of topics about which knowledge is necessary in order to pass the examinations or complete the requirements for certificates. It should also recommend to examining and accrediting authorities that in their statements of entrance requirements in the sciences they urge teachers that, in their conduct of the recitation and the laboratory work, they pay more attention to inculcating the spirit of science, and giving insight into its method. A more important need than this, however, is that of stimulating the science teachers under their supervision to study the books that have here been mentioned, to try to catch their scientific spirit and profit by the information that they contain. A teacher who is unwilling to give such helps careful and conscientious study and thought can scarcely be worthy of retention in a school system. That very many teachers of science are ignorant of the contents of these books I personally know, and I have often found teachers who had never even heard of them. Also every science teacher should be a methodical reader of *School Science and Mathematics*, and should be encouraged to join and attend the meetings of such bodies as the Central Association of Science and Mathematics Teachers, the Michigan Schoolmasters Club, and the Eastern Association of Physics Teachers, when such associations exist in their neighborhood. Furthermore, those teachers of science who are competent and who wish to make variations from the traditional subject-matter and methods for purposes of trying out new ones, should be given encouragement, sympathetic cooperation and unequivocal support.

College teachers of science often complain that their pupils are poorly prepared in science and that the high school teachers are at fault. No doubt there is much truth in this, but the colleges must bear more of the responsibility for it than any other single agency. A large part of the trouble comes from the fact that more mediocre and inferior students are now found in colleges than were found there a generation ago, when only the picked boys and girls from the more intellectual families were given a college education. But another large part of it is due to the fact that the majority of men and women who are teaching in high schools have themselves been poorly taught by their college teachers. The kind of courses in science commonly given in colleges do not very generally develop the scientific spirit or the open-minded scientific attitude toward teaching problems. But if the young people who go out of these courses to teach in the high schools are not given in connection with their subjects some of the fundamental habits, ideals, attitudes and principles that make for success in teaching them, where are they to get these essentials? It is true that an earnest and industrious person knowing his subject well may ultimately learn some good methods by the trial and error type of learning; but what of the students who become disgusted with science or are stuffed with false conceptions while their teachers are learning to teach. The majority of college teachers of science are inclined to look upon pedagogy as an inferior subject for thought. Any one of their number who turns aside from research work in the subject-matter of his science to study how he may improve his own methods of teaching or to help high school teachers in improving theirs is apt to be looked upon as having fallen from grace and lost caste.

This attitude is promoted, against their own professions and probably against their desires, by many college presidents, most of whom would answer, if you put the question to them, that the most important function of a college or university is to teach. Yet among the struggling instructors and assistant professors, who are the men that get the honors, the pro-

motions, the advances in salary? Those who are conspicuous as good teachers, but not persistent publishers of research work, or those who regularly grind out the research work and are not conspicuously good teachers? Research is unquestionably a worthy and important function of the college, and an essential function of the university; but is not teaching at least as important a function? Doubtless it seems so to those students at least whose time and tuition fees are to them a sacrifice. Ought not this system in which, rather than in the men, the fault lies, to be changed? *Ought there not to be in every department at least one man who is a superior teacher and a master of the pedagogy of his subject?* And how can such men be developed excepting by singling out the young men who have exceptional ability and a strong interest in the teaching side of their subjects and giving them remuneration, rank and honor equal to that given men of less teaching ability, but more productive in research? And again are not the history, the psychology, and the pedagogy of the subjects as legitimate and admirable fields for research and publication, as that of the subjects themselves? And are not books and teaching which will attract more students to science and produce better high school teachers as important in the long run for the advancement of science as the results of almost any other work of the average college teacher requiring a like amount of time?

Those who would answer these questions in the negative, if any there are, would seem to have a less adequate comprehension of the far reaching effect of good teaching that society has a right to demand of those who are engaged in that function, which is so essential to its existence. By all means let those who can and do produce research work of capital importance to science have the highest rank, remuneration and honor. But let the means of attracting better ability to the teaching of science, and the means of affording its possessors a better kind of training be given more earnest thought by those who are responsible for providing these means.

GEORGE R. TWISS

OHIO STATE UNIVERSITY

EDUCATIONAL JOURNALS

The School Review for March

Vocational training in Chicago schools: John T. McManis.

A test of the attainment of first-year high-school students in algebra: Walter S. Monroe.

The dictating machine in the schools: Howard P. Taylor.

Vocational information for pupils in a small city high school: W. A. Wheatley.

Some facts about the general science situation: W. L. Eikenberry.

Educational news and editorial comment; book reviews; book notes; current educational literature in the periodicals.

Manual Training and Vocational Education for March

A policy of industrial education: John Dewey.

The vocational education association of the middle west: Charles A. Bennett.

Proportioning glued joints (illustrated): Frederick H. Evans.

Another lesson from the steel square (illustrated): Velters V. Logan.

An experiment in the making and use of furniture by second grade pupils (illustrated): Iza Edith Andrix.

Editorial; of current interest; shop notes and problems; reviews.

The English Journal for March

The laboratory equipment of the teacher of English: Mary Crawford.

The trial of Banquo: C. C. Certain.

English literature for sophomores: Frederick I. Pohl.

Macaulay's essays and the freshman: Hyder E. Rollins.

Elocution redivivus: C. H. Woolbert.

The use of the conference hour: Wahnita DeLong.

The value of story-telling in the high-school course: Mary Frothingham Prichard.

The round table: English and the six-six plan; news and notes; digest of periodical literature; reviews and book notices.

REPORT TO THE UNIVERSITY COUNCIL OF MASSACHUSETTS OF THE COMMITTEE ON THE BUREAU OF EXPERT SERVICE

YOUR committee has made inquiries from all the institutions represented on the univer-

sity council with reference to the public services of members of their respective faculties, and has read with appreciation the report of the committee of the Alumni Association of the Massachusetts Institute of Technology dealing with organized cooperation between that institution and the commonwealth. These investigations show that much has already been done, as is indicated in part by the summary of the accomplishments of a single year appended to this report. What is chiefly needed at this time is *organization* so as to get the benefit of the cooperation of all instead of only a part as at present, and *publicity* so as to bring home to the consciousness of the community the fact that the University Council through the faculties of its constituent colleges is able and willing to render a great service. Doubtless greater advantage would be taken of the opportunities presented were their existence more generally known.

SERVICE ON COMMISSIONS

The most conspicuous example of service on the part of the professors is that on boards and commissions of the state or of cities within it. A large number of men and women on the faculties of the various institutions represented on the council are eminently well qualified for such service and willing to render it. In dealing with many of the problems presented to such commissions, it is specially important to have them investigated by men trained in impartial modes of thought and familiar by long practise in attacking problems by the scientific method and in the scientific spirit. This is true not merely of problems that are technical in the narrow sense but of most if not all of the problems presented in the regulation of our public life. Much important service on state and municipal boards and commissions has already been rendered by professors within the commonwealth. These professors usually welcome the opportunity of service of a constructive character, especially when they feel that they are helping the community to make real progress, and this experience gives vitality to their teaching as well as direct benefit to the community. Your committee recommends that the university council encourage such service by urging its constituents to give special facilities whenever necessary to enable their professors to render service of the character here indicated. It may be possible to give a certain measure of relief from academic duties where service on important commissions interferes with the performance of a professor's regular duty to his college, although in the case of paid commissions the commissioner might reasonably be expected to pay for the cost of providing a substitute to carry on his academic work. Your committee recommends that the standing committee on bureau of expert service be authorized on behalf of the university council to make recommendations for appointments on state and municipal boards or commissions where suggestions from the council are sought by the appointing power, leaving that power free to communicate directly with individuals or separate colleges if it seems expedient so to do.

OTHER FORMS OF SERVICE

The professors in our colleges can render important services to the state, to cities and to private corporations or individuals by placing their specialized knowledge at the disposal of those who wish to profit by it. It would not, however, be reasonable or practicable to expect them to render a continuing service of this kind without proper compensation. Such continuing service may be rendered and may be specially valuable where impartiality or authority is needed. The analysis of products, the testing of materials and of machines and similar investigations that should be made before expenditures are incurred in the purchase of supplies can often be particularly well rendered under the direction of professors whose responsibility to their institutions as well as to the public is a compelling force to insure impartiality. For work of this kind involving an appreciable amount of time in its performance professors should be reasonably compensated by those utilizing their services. It should be pointed out, perhaps, that although the duties of a professor to his college generally prevent him from giving continuous

service during the working part of the academic year, he may be free during the long summer vacation to carry on extensive investigations and give almost continuous service.

A great deal of useful service, not of the continuing kind, is being performed, and might well be extended by professors who are ready to render what might be called "first aid" in attacking various problems. With their expert knowledge they can often easily indicate the sources of information or suggest lines of investigation with little expenditure of time or energy. Service of this kind might well be rendered, in the future as in the past, freely by the professors in the colleges as a contribution to the public good. Of course, however, they should be reimbursed for any actual expenses that they may have incurred in order to render such "first aid." The standing committee on bureau of expert service should be authorized to suggest the names of professors for services of this kind as well as of those referred to in the preceding section.

USE OF LABORATORIES

Your committee recommends that the laboratories of the constituent colleges be placed at the disposal of the state and of the cities within it for the solution of state and municipal problems. In some cases there exist state or municipal laboratories equipped for special service, but most of the towns and cities of the state are without such facilities, and even where they exist they could often be supplemented to advantage by the well-equipped laboratories of the educational institutions. The conditions under which these laboratories could be used, must, of course, be determined by the authorities of the different colleges and your committee recommends that the university council encourage the use of the laboratories as freely as possible. It suggests that no direct charge should be made for the use of these laboratories, but the state or city should bear the expense of all labor or materials used for its work, and in addition to this pay some fee to cover incidental expenses of wear and tear and depreciation, the amount of this fee being fixed by the authorities controlling the laboratories.

BUREAU OF INFORMATION

Great losses are incurred all over the state by carrying on operations without adequate information and much waste of time and energy is involved in seeking information that has already been acquired elsewhere. This is an evil that can not be wholly cured, but it can be minimized by various expedients. One of these that has been tried with varying success but which presents great possibilities if properly supported and directed, is the establishment of a bureau or bureaus of information. In so far as the information sought can be obtained from books and periodicals without expert assistance, much could be achieved by the proper use of the extensive system of libraries to be found throughout the commonwealth. A bureau of information should organize this system and give it vitality. In many cases, especially when technical problems are involved, the library staffs to be effective would need such help and direction as might be given by professors within the colleges. It does not seem to your committee that the overhead charges for collecting and distributing information obtained from professors and for obtaining information by routine methods such as the consultation of reference books by a secretarial staff should be defrayed by the colleges. Your committee recommends, however, that if a bureau of information be established by the state or otherwise the university council cooperate therewith by urging its constituents to give information freely where it can be obtained without substantial expense. In most cases members of the faculties and other college officers would be willing to furnish information that is at their disposal and is easily imparted or to indicate profitable lines of inquiry.

RICHARD MACLAURIN,
Chairman

EDUCATIONAL RESEARCH AND STATISTICS

THE RELATION BETWEEN INITIAL ABILITY AND IMPROVEMENT IN A SUBSTITUTION TEST

ONE hundred and twenty-three college students were given practise in writing the products of 11×11, 11×12, 12×11, 11×13,

13 × 11, and so on up to 19 × 19. The products were written on sheets like that reproduced below, being found from memory or from a key like that reproduced below. Four

SAMPLE PRACTISE SHEET

13	19	14	11	15	15	17	11	19	15
16	11	11	19	12	17	12	14	18	18
18	19	15	13	16	17	13	15	14	17
19	12	18	17	17	15	17	16	16	16
12	13	12	18	13	14	15	14	12	15
16	15	13	17	15	11	11	17	13	16
14	15	16	18	11	13	14	19	12	11
17	12	11	12	14	18	15	17	17	14
11	11	14	16	16	14	18	14	19	16
15	18	18	12	11	16	13	13	14	14
11	15	15	16	14	13	12	16	15	19
15	18	17	17	19	18	16	19	16	12
19	14	13	12	15	12	19	11	17	19
13	11	16	13	17	13	14	12	18	11
19	19	11	14	18	15	12	19	19	13
18	16	17	18	11	18	18	13	19	17

different sheets were used, each three times. Except for the 11 × 11 and 12 × 12 memory was rarely depended on in the first trial, and was not much used in even the last trial of the twelve. For our purposes it is a matter of indifference how far the memory of particular products cooperated with the use of the key. The subjects did not do anything to improve the process save actually to find and enter the 960 products as rapidly as they could. They were instructed not to score any sheet for accuracy or examine it in any way, until all had been completed. The work was done in from one to six sittings, but these differences are irrelevant to our problems, since they were distributed at random amongst those of initially high and initially low scores.

KEY

	11	12	13	14	15	16	17	18	19
11	121	132	143	154	165	176	187	198	209
12		144	156	168	180	192	204	216	228
13			169	182	195	208	221	234	247
14				196	210	224	238	252	266
15					225	240	255	270	285
16						256	272	288	304
17							289	306	323
18								324	342
19									361

The scores recorded were (1) the time required for each successive sheet, (2) the number of wrong products in each successive sheet, and (3) the time required for each sheet plus 10 seconds for each wrong product.

The average score by (3) was computed for those who in the first trial required under 6 minutes (allowance being made for wrong products) for the sheet; for those requiring 6 minutes up to 7; for those requiring 7 minutes up to 8; and so on. The facts are shown in Table I.

If we divide 80 by each of these average scores we have them in terms of products produced per unit of time, allowance being made for quality (the resulting number may

TABLE I

Average Time Required (10 Sec. for Each Wrong Product) to Find and Enter Each Successive Set of 12 Sheets, Each of 80 Products, in Minutes

	1	2	3	4	5	6	7	8	9	10	11	12
For 5 individuals with initial times under 6.0 min.	5.22	4.58	4.28	3.78	4.30	3.75	3.54	3.33	3.45	3.41	3.47	3.30
For 36 individuals with initial times 6.0 to 7.0 min.	6.40	5.90	5.38	5.09	4.82	4.79	4.58	4.46	4.38	4.13	4.11	3.96
For 30 individuals with initial times 7.0 to 8.0 min.	7.42	6.31	5.67	5.47	5.03	4.91	4.93	4.68	4.72	4.59	4.65	4.29
For 23 individuals with initial times 8.0 to 9.0 min.	8.29	6.85	6.18	5.91	5.14	5.44	5.42	5.47	5.28	5.17	5.04	4.86
For 10 individuals with initial times 9.0 to 10.0 min.	9.62	8.44	6.42	6.49	5.65	5.50	5.70	5.51	5.39	5.39	4.71	4.92
For 10 individuals with initial times 10.0 to 11.0 min.	10.47	7.89	7.12	6.69	6.28	5.85	5.55	5.73	5.33	5.28	5.14	5.36
For 9 individuals with initial times over 11.0 min.	13.19	8.61	7.04	7.01	5.96	6.16	5.88	6.22	5.81	5.70	5.64	5.48

TABLE II

Approximate Product Produced per Minute (with Allowance for Errors) in the Case of Each Successive Sheet

	Sheet 1	Sheet 2	Sheet 3	Sheet 4	Sheet 5	Sheet 6	Sheet 7	Sheet 8	Sheet 9	Sheet 10	Sheet 11	Sheet 12
For 6 individuals with initial times under 6.0 min.	15.4	17.4	18.7	2' 2	18.6	21.4	22.6	24.0	23.2	23.4	23.0	24.2
For 36 individuals with initial times 6 0 to 7.0 min.	12.5	13.5	14.9	15.7	16.6	16.7	17.4	17.9	18.2	19.4	19.4	20.2
For 30 individuals with initial times 7.0 to 8.0 min.	10.8	12.6	14.1	14.6	15.9	16.3	16.2	17.1	17.0	17.4	17.2	18.6
For 23 individuals with initial times 8.0 to 9.0 min.	9.7	12.0	13.0	13.5	15.6	14.7	14.8	14.6	15.1	15.4	15.8	16.5
For 10 individuals with initial times 9.0 to 10.0 min.	8.3	9.4	12.5	12.3	14.2	14.6	14.0	14.5	14.9	14.9	17.0	16.2
For 10 individuals with initial times 10.0 to 11.0 min.	7.7	10.2	11.2	11.9	12.7	13.7	14.4	14.0	15.0	15.1	15.6	15.0
For 9 individuals with initial times over 11.0 min.	6.1	9.3	11.4	11.4	13.4	13.0	13.6	12.9	13.8	14.0	14.2	14.6

be thought of as approximately the number of products found per minute in errorless work). The results so stated are shown in Table II.

If now we compare the improvement made in the course of approximately fifty minutes of time spent in practise by these groups, differing as they do in initial ability, the results are as stated in Table III. In general the gross improvement in product produced per unit of time is greatest for those of initially highest ability. The effect of equalizing opportunity is to leave the gross variability between individuals unimpaired or even to increase it. The relative ability shown in the early stages of the learning is closely representative of the relative ability that will be shown after a considerable amount of practise, the amount being equal (in time spent) for all.

TABLE III

Group	Approximate Product Produced per Minute		Time Spent in Practise			
	1 In First Sheet Done	2 In Sheet Done After About 45 Minutes of Practise	3 From Beginning of First Sheet to End of Sheet Referred to in Column 2	4 From Midpoint of First Sheet to Midpoint of Sheet Referred to in Column 3	5 Gain	
A	15.4	24.2	46.4	42.3	8.8	7.4
B	12.5	19.4	48.9	43.7	6.9	
C	10.8	17.3	49.1	43.1	6.5	
D	9.7	15.1	54.0	47.1	5.4	
E	8.3	14.5	53.3	45.8	6.2	6.8
F	7.7	14.4	49.9	41.8	6.7	
G	6.1	13.6	53.9	44.3	7.5	

The results of this experiment are typical of those obtained in similar experiments with addition, multiplication, division, number-checking and the like. They give evidence bearing on two of the most important problems of education, showing, first, that it is unsafe to assume that the differences found amongst individuals in intellect, character and skill are due chiefly to the different opportunities which the individuals have enjoyed; and, second, that the status which an individual has attained in a function from any given amount of practise is highly prophetic of the status which he will attain from any given amount of additional practise.

EDWARD L. THORNDIKE
TEACHERS COLLEGE, COLUMBIA UNIVERSITY

SOCIETIES AND MEETINGS

OHIO SOCIETY OF COLLEGE TEACHERS OF EDUCATION

A PERMANENT organization of the Ohio Society of College Teachers of Education was effected at the second meeting of the society, held at Cincinnati on February 23, by the adoption of a constitution and the election of officers. Dr. L. F. Anderson, of Ohio State

University, was chosen president and Professor A. J. Miller, of the College of Wooster, secretary-treasurer. By motion a school legislation committee was created to consist of the executive committee and Dean H. C. Minnich, of Miami University.

A cordial invitation is extended to all Ohio college teachers of education or administrators to ally themselves with the organization as active or associate members. Any one interested in the problems of education is invited to attend the open meetings.

The next conference will be held at Columbus, Ohio, on April 1, at the time of the meeting of the Association of Ohio Colleges and Universities.

CONSTITUTION

Preamble

In order to promote the efficiency of the instruction and training in education in the colleges and universities of Ohio, we, the undersigned, do hereby adopt the following constitution.

Article I. Name

This society shall be called The Ohio Society of College Teachers of Education.

Article II. Purpose

The purpose of the society shall be the discussion of problems relating to the work of college teachers of education in the state of Ohio.

Article III. Membership

Section 1. The membership of the society shall consist of active and associate members.

Section 2. All residents in Ohio eligible to membership in the National Society of College Teachers of Education and all whose professional activities consist in whole or in part in administrative or instructional work in education in colleges and universities in Ohio shall be considered eligible as active members of the society.

Section 3. Those summoned to attend and in attendance at either of the preliminary meetings of the society who shall sign this constitution and pay the membership fee shall be regarded as charter members.

Section 4. All persons, not belonging to either of the classes mentioned in Section 2, who are actively interested in the work of the society, shall be eligible as associate members.

Section 5. All members other than charter members shall be elected by the executive committee.

Section 6. The membership fee shall be one dollar a year.

Section 7. The right to vote shall be restricted to active members.

Section 8. One fourth of the membership shall constitute a quorum for the transaction of business.

Article IV. Officers

Section 1. The officers of the society shall be a president and a secretary-treasurer elected annually by the society. They shall perform the duties usually appertaining to these offices.

Section 2. The president and the secretary treasurer shall constitute the executive committee of the society.

Article V. Meetings

The time and place of meeting and the topics to be discussed shall be determined so far as possible by a majority vote of the society.

Article VI. Amendments

Amendments to this constitution may be made by a two-thirds vote of the members present at the regular meeting subsequent to that at which the amendment has been proposed.

THE HARVARD TEACHERS' ASSOCIATION

The Harvard Teachers' Association held its twenty-fourth annual conference at the university on March 13, taking for a general topic of discussion "Recent Movements in Secondary Education." At the morning session, held in Sanders Theater, the principal addresses were by W. A. Jessop of the University of Iowa, on "The Six-year High School Plan," and Rufus Stimson, Massachusetts state agent for agricultural education, on "The Massachusetts Home Project Plan of Vocational Agricultural Education." Following this morning meeting, the delegates met at the Union for a lunch, after which three more speeches on educational topics were given: Joseph Lee, president of the association, on "The Two Realities of Education"; Professor William E. Hocking, of the Harvard philosophy department, on "The Culture Worth Getting in College," and E. O. Sisson, state commissioner of education in Idaho, on "Western Ideals and Movements in Secondary Education."